

Switch Interoperability | Guide

SANbox™

v1

3/2003



SAN

THE ONLY SOURCE FOR MULTI-VENDOR INTEROPERABILITY

QLOGIC PRESS



QLogic Switch Interoperability Guide

Version 1.0

Copyright © 2002 QLogic Corporation. All rights reserved.

QLogic Corporation and its strategic Partners, henceforth known as the "Partners," have agreed to provide a switch interoperability reference document. THE INFORMATION PROVIDED IN THIS DOCUMENT IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, INTEROPERABILITY, OR COMPATIBILITY. All of the Partners' products are warranted in accordance with the agreements under which the warranty for the products are provided. Unless otherwise specified, the product manufacturer, supplier, or publisher of non-Partner products provides warranty, service, and support directly to you. THE PARTNERS MAKE NO REPRESENTATIONS OR WARRANTIES REGARDING THE PARTNERS PRODUCTS OR NON-PARTNER PRODUCTS AND NO WARRANTY IS PROVIDED FOR EITHER THE FUNCTIONALITY OR PROBLEM RESOLUTION OF ANY PRODUCTS.

The inclusion of the Partners' switch interoperability is not a guarantee that they will work with the other designated storage products. In addition, not all software and hardware combinations created from compatible components will necessarily function properly together. The following document includes products developed or distributed by companies other than the Partners. The Partners do not provide service or support for the non-Partner products listed, but does not prohibit them from being used together with their storage products. During problem debug and resolution, the Partners may require that hardware or software additions be removed from products to provide problem determination and resolution on the supplied hardware/software. For support issues regarding non-Partner products, please contact the manufacturer of the product directly.

This information could include technical inaccuracies or typographical errors. The Partners do not assume any liability for damages caused by such errors as this information is provided "AS IS" for convenience only; the reader uses this information at its own risk, and should confirm any information contained herein with the associated vendor. Changes are periodically made to the content of this document. These changes will be incorporated in new editions of the document. The Partners may make improvements and/or changes in the product(s) and/or the program(s) described in this document at any time without notice.

Any references in this information to non-Partner Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this *Switch Interoperability Guide* and the use of those Web sites is at your own risk. Information concerning non-Partner products was obtained from the suppliers of those products, their published announcements, or other publicly available sources. The Partners have not tested those products and cannot confirm the accuracy of performance, compatibility, or any other claims related to those products. Questions about the capabilities of non-Partner products should be addressed to the suppliers of those products.

All statements regarding the Partners' future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only. This information is only for planning purposes, any use of the information contained herein is at the user's sole risk. The information herein is subject to change before the products described become available.

QLogic reserves the right to change specifications or other product information without notice. This publication could include technical inaccuracies or typographical errors. QLogic makes no representations nor warranties regarding non-QLogic products or services. References herein to QLogic products and services do not imply that QLogic intends to make them available to other countries.

Brocade, the Brocade logo, and SilkWorm are trademarks or registered trademarks of Brocade Communications Systems, Inc. in the United States, other countries, or both.

Cisco, Cisco IOS, Cisco Systems, and the Cisco Systems logo are trademarks or registered trademarks of Cisco Systems, Inc.

IBM, the IBM logo, e(logic)server, and BladeCenter are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both.

INRANGE and the INRANGE logo are trademarks or registered trademarks of Inrange Technologies Corporation in the United States, other countries, or both.

McDATA, the McDATA logo, and Sphereon are trademarks or registered trademarks of McDATA Corporation in the United States, other countries, or both.

Microsoft is a trademark or registered trademark of Microsoft corporation in the United States, other countries, or both.

QLogic, the QLogic logo, SANblade, and SANbox are trademarks or registered trademarks of QLogic Corporation in the United States, other countries, or both.

Sun, Sun Microsystems, the Sun logo, Solaris, Sun Management Center, and Sun StorEdge are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

The QLogic home page on the Internet can be found at <http://www.qlogic.com>. Updated versions of this guide can be downloaded from the following QLogic Web site: <http://www.qlogic.com/interopguide>.

QLogic Corporation
26650 Aliso Viejo Parkway
Aliso Viejo, CA 92656
(800) 867-7274 or (949) 389-6000

Table of Contents

Introduction	1
Supported Switches and Firmware Versions	3
How to Use this Guide	5
Merging QLogic and Brocade Fabrics	7
Brocade SilkWorm 3200 and SilkWorm 3800 Switches	9
Integration Checklist	9
Configuration Limitations	10
Supported Switches and Firmware Versions	10
Domain ID Configuration	11
Timeout Values	18
Principal Switch Configuration	24
Zone Configuration	25
Active Zone Set Names	25
Zone Types	31
Operating Mode Configuration	37
Brocade Specific Configuration	37
QLogic Specific Configuration	38
Successful Integration Checklist	38
Brocade SilkWorm 3900 and SilkWorm 12000 Switches	39
Integration Checklist	39
Configuration Limitations	40
Supported Switches and Firmware Versions	40
Domain ID Configuration	41
Timeout Values	48
Principal Switch Configuration	54
Zone Configuration	55
Active Zone Set Names	55
Zone Types	62
Operating Mode Configuration	68
Brocade Specific Configuration	68
QLogic Specific Configuration	68

Successful Integration Checklist	69
Merging QLogic and Cisco Fabrics	71
Cisco SN 5428 Storage Router	73
Integration Checklist	73
Configuration Limitations	73
Supported Switches and Firmware Versions	74
Domain ID Configuration	75
Timeout Values	81
Principal Switch Configuration	85
Zone Configuration	86
Active Zone Set Names	86
Zone Types	90
Operating Mode Configuration	90
Cisco Specific Configuration	91
QLogic Specific Configuration	92
Successful Integration Checklist	92
Cisco MDS 9000 Series Switches	93
Integration Checklist	93
Configuration Limitations	93
Supported Switches and Firmware Versions	94
Domain ID Configuration	94
Timeout Values	100
Principal Switch Configuration	107
Zone Configuration	107
Active Zone Set Names	107
Zone Types	113
Operating Mode Configuration	118
Cisco Specific Configuration	118
QLogic Specific Configuration	118
Successful Integration Checklist	118
Merging QLogic and IBM BladeCenter Fabrics	119
IBM eServer BladeCenter Fibre Channel Switch Module	121
Integration Checklist	121
Configuration Limitations	121
Supported Switches and Firmware Versions	122

Domain ID Configuration	123
Timeout Values	130
Principal Switch Configuration	136
Zone Configuration	137
Active Zone Set Names	137
Zone Types	142
Operating Mode Configuration	143
IBM BladeCenter Specific Configuration	144
QLogic Specific Configuration	144
Successful Integration Checklist	145
Merging QLogic and INRANGE Fabrics	147
INRANGE FC/9000 Switch	149
Integration Checklist	149
Configuration Limitations	150
Supported Switches and Firmware Versions	150
Domain ID Configuration	150
Timeout Values	155
Principal Switch Configuration	160
Zone Configuration	161
Active Zone Set Names	161
Zone Types	171
Operating Mode Configuration	178
INRANGE Specific Configuration	178
QLogic Specific Configuration	179
Successful Integration Checklist	179
Merging QLogic and McDATA Fabrics	181
McDATA Sphereon 4500 Switch	183
Integration Checklist	183
Configuration Limitations	183
Supported Switches and Firmware Versions	184
Domain ID Configuration	184
Timeout Values	192
Principal Switch Configuration	200
Zone Configuration	201
Active Zone Set Names	201
Zone Types	208

Operating Mode Configuration	214
McDATA Specific Configuration	218
QLogic Specific Configuration	218
Successful Integration Checklist	219
McDATA Intrepid 6000 Series Directors	221
Integration Checklist	221
Configuration Limitations	221
Supported Switches and Firmware Versions	222
Domain ID Configuration	222
Timeout Values	231
Principal Switch Configuration	239
Zone Configuration	240
Active Zone Set Names	240
Zone Types	247
Operating Mode Configuration	254
McDATA Specific Configuration	258
QLogic Specific Configuration	258
Successful Integration Checklist	259
Merging QLogic and Sun Fabrics	261
Sun StorEdge Network 2 Gb FC Series Switches	263
Integration Checklist	263
Configuration Limitations	263
Supported Switches and Firmware Versions	264
Domain ID Configuration	265
Timeout Values	272
Principal Switch Configuration	278
Zone Configuration	279
Active Zone Set Names	279
Zone Types	286
Operating Mode Configuration	292
Sun StorEdge Specific Configuration	292
QLogic Specific Configuration	292
Successful Integration Checklist	292

Glossary	293
Index	299
Contacting QLogic.....	305

Introduction

The *QLogic Switch Interoperability Guide* provides the details needed to configure and deploy multi-vendor switched fabrics. Detailed switch configuration data and step-by-step configuration procedures are provided to merge QLogic switches into existing Brocade, Cisco, IBM, INRANGE, McDATA, and Sun Fibre Channel switched fabrics that comply with the second revision of the Fibre Channel switch standard (FC-SW-2).

FC-SW-2 is an open standard for switch-to-switch communication, allowing end users to choose best-in-class products with the assurance that these products can be deployed in multi-vendor storage area networks (SANs). Fibre Channel switches complying with this standard communicate connectivity and configuration information, path selection, and routing, as well as management and event services using the same language. FC-SW-2 also provides standardized mechanisms for SAN management. These applications can configure, manage, and monitor multi-vendor Fibre Channel SANs from any particular point in the fabric.

QLogic switches, along with switches from Brocade, Cisco, IBM, INRANGE, McDATA, and Sun can communicate across three specified FC-SW-2 levels, enabling end-users to deploy products that best suit their needs.

Level 1 addresses switch connectivity and configuration by allowing Fibre Channel switches to interoperate at the link level and by enabling switches to be configured as part of physical and logical configurations (such as Zoning). Fabric Zones allow customers to partition their storage network based on application requirements and to create virtual private SANs within a larger SAN.

Level 2 defines path selection and routing, which create interoperability at the operational level. The fabric shortest path first (FSPF) selection process, which is a key element of FC-SW-2, allows paths to be set up between end devices using multi-switch fabrics. This enables customers to design and implement Fibre Channel configurations based on their individual requirements.

Level 3 specifies management and event services. These services allow Fibre Channel services to be implemented using a distributed model, increasing availability and scalability throughout the entire fabric. The Name Server and Management Server allow the physical and logical SAN topology to be discovered through upper-level SAN management applications, thereby facilitating resource management and capacity planning. Event services create the means for SAN administrators to be notified in case of configuration changes, allowing them to take appropriate action.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard.

QLogic Supported Switch and Firmware Versions

Switch Model	Firmware Version
SANbox2-8 Switch	1.3.x and above
SANbox2-16 Switch	1.3.x and above
SANbox2-64 Switch	1.5.x and above

The QLogic switches have been tested interoperable with the following switches from Brocade, Cisco, IBM, INRANGE, McDATA, and Sun that comply with the FC-SW-2 standard. See the referenced page for detailed instructions on merging QLogic fabrics and these fabrics.

Brocade, Cisco, IBM, INRANGE, McDATA, and Sun Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
Brocade (see page 7)	SilkWorm 3200 Switch	3.0.2g and above
	SilkWorm 3800 Switch	3.0.2g and above
	SilkWorm 3900 Switch	4.0.2c and above
	SilkWorm 12000 Switch	4.0.2c and above
Cisco (see page 71)	SN 5428 Storage Router	2.3.1-k9 or above
	MDS 9216 Switch	1.0(1) [build 1.0(0.281)]
	MDS 9509 Director	1.0(1) [build 1.0(0.281)]
IBM (see page 119)	IBM eServer BladeCenter Fibre Channel Switch Module	1.4.0.35.00 or above
INRANGE (see page 147)	FC/9000 Switch	Code set 3.0.3.2 or above
McDATA (see page 181)	Sphereon 4500 Switch	04.01.00 12 and above
	Intrepid 6064 Director	04.01.02.4 and above
	Intrepid 6140 Director	04.01.02.4 and above
Sun (see page 261)	Sun StorEdge Network 2 Gb FC Switch-8	1.3.x and above
	Sun StorEdge Network 2 Gb FC Switch-16	1.3.x and above

How to Use this Guide

The *QLogic Switch Interoperability Guide* provides detailed switch configuration data and step-by-step configuration procedures for merging QLogic Fibre Channel switched fabrics with Brocade, Cisco, IBM, Inrange, McDATA, and Sun Fibre Channel switched fabrics.

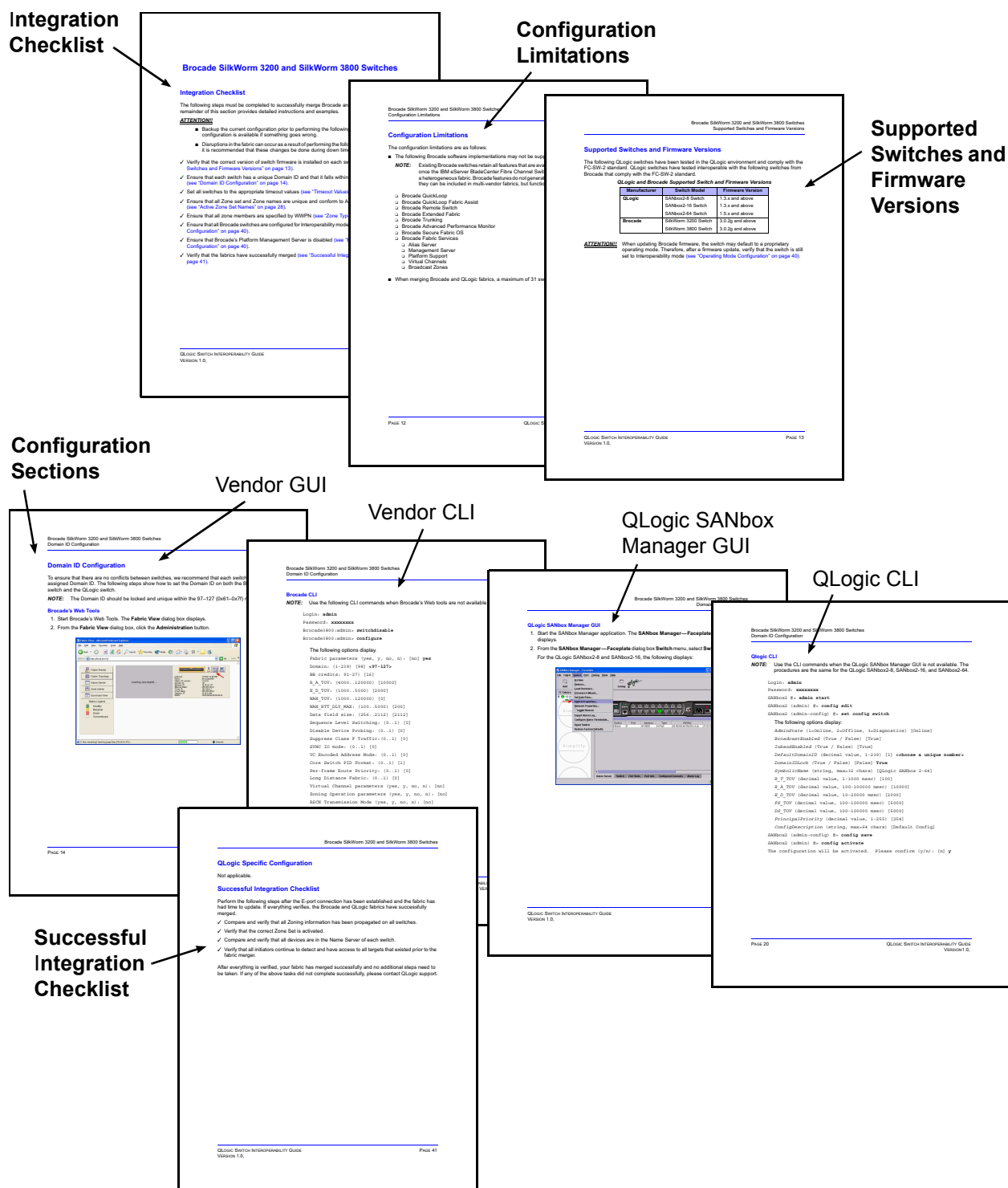
NOTE: Updated versions of this guide can be downloaded from the following QLogic Web site:
<http://www.qlogic.com/interopguide>.

All chapters within the *QLogic Switch Interoperability Guide* are organized the same way. For a visual representation, [see page 6](#).

- **Integration Checklist.** Lists the steps that must be completed to successfully merge the fabrics.
- **Configuration Limitations.** Details the configuration limitations, including features not supported by the vendor switches and QLogic switches.
- **Supported Switches and Firmware Versions.** The supported switches and firmware versions for which this information applies.
- For the vendor switch and the QLogic switch, this guide provides graphical user interface (GUI) and command line interface (CLI) information, as appropriate, for the following:
 - **Domain ID Configuration**
 - **Timeout Values**
 - **Principal Switch Configuration**
 - **Zone Configuration**
 - **Operating Mode Configuration**
 - **Vendor and QLogic Specific Configuration**
- **Successful Integration Checklist.** Lists the steps to be taken after the E-port connection has been established and the fabric has had time to update.

In addition, refer to the **Glossary** ([see page 293](#)) for terms used in this guide, the **Index** ([see page 299](#)) for quick reference to key topics, and **Contacting QLogic** ([see page 305](#)) for QLogic locations, programs, sales, and technical support.

Visual Representation of How the Chapters Are Organized



Merging QLogic and Brocade Fabrics

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

QLogic and Brocade Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
Brocade	SilkWorm 3200 Switch	3.0.2g and above
	SilkWorm 3800 Switch	3.0.2g and above
	SilkWorm 3900 Switch	4.0.2c and above
	SilkWorm 12000 Switch	4.0.2c and above

The following chapters provide detailed information about merging Sun and Brocade fabrics:

- **Brocade SilkWorm 3200 and SilkWorm 3800 Switches** ([see page 9](#))
- **Brocade SilkWorm 3900 and SilkWorm 12000 Switches** ([see page 39](#))

Brocade SilkWorm 3200 and SilkWorm 3800 Switches

Integration Checklist

The following steps must be completed to successfully merge Brocade and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch ([see “Supported Switches and Firmware Versions” on page 10](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range ([see “Domain ID Configuration” on page 11](#)).
 - ✓ Set all switches to the appropriate timeout values ([see “Timeout Values” on page 18](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards ([see “Active Zone Set Names” on page 25](#)).
 - ✓ Ensure that all zone members are specified by WWPN ([see “Zone Types” on page 31](#)).
 - ✓ Ensure that all Brocade switches are configured for Interoperability mode ([see “Operating Mode Configuration” on page 37](#)).
 - ✓ Ensure that Brocade’s Platform Management Server is disabled ([see “Brocade Specific Configuration” on page 37](#)).
 - ✓ Verify that the fabrics have successfully merged ([see “Successful Integration Checklist” on page 38](#)).

Configuration Limitations

The configuration limitations are as follows:

- The following Brocade software implementations may not be supported in QLogic fabrics.

NOTE: Existing Brocade switches retain all features that are available with Brocade switches once the IBM eServer BladeCenter Fibre Channel Switch Module is integrated into a heterogeneous fabric. Brocade features do not generate interswitch traffic. As such, they can be included in multi-vendor fabrics, but function on Brocade switches only.

- ❑ Brocade QuickLoop
- ❑ Brocade QuickLoop Fabric Assist
- ❑ Brocade Remote Switch
- ❑ Brocade Extended Fabric
- ❑ Brocade Trunking
- ❑ Brocade Advanced Performance Monitor
- ❑ Brocade Secure Fabric OS
- ❑ Brocade Fabric Services
 - ❑ Alias Server
 - ❑ Management Server
 - ❑ Platform Support
 - ❑ Virtual Channels
 - ❑ Broadcast Zones

- When merging Brocade and QLogic fabrics, a maximum of 31 switches can be configured.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

QLogic and Brocade Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
Brocade	SilkWorm 3200 Switch	3.0.2g and above
	SilkWorm 3800 Switch	3.0.2g and above

ATTENTION!! When updating Brocade firmware, the switch may default to a proprietary operating mode. Therefore, after a firmware update, verify that the switch is still set to Interoperability mode ([see “Operating Mode Configuration” on page 37](#)).

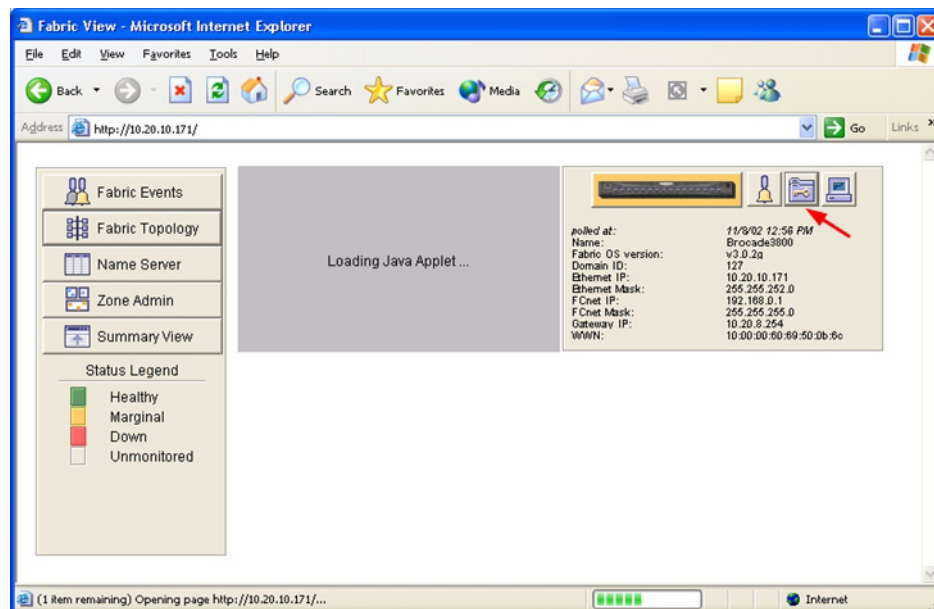
Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Brocade switch and the QLogic switch.

NOTE: The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Administration** button.



3. From the **Switch Admin for Brocade** dialog box, select the **Switch Settings** tab. Do the following:
 - a. In the **Domain ID** field, type or edit the Domain ID as appropriate.
 - b. Click **OK**.

Switch Admin for Brocade3800 - Microsoft Internet Explorer

SwitchName: Brocade3800 DomainId: 127 WWN: 10:00:00:60:69:50:0b:6c Fri Nov 8 2002, 1:00 PM

Report | Port Setting | User Admin | Configure | Routing | Extended Fabric
Switch Settings | Network Config | Firm Upgd | SNMP | Lic Admin

Name and Id
Name: Brocade3800 Serial Number: 10:00:00:60:69:50:0b:6c
Domain Id: 127

Status
☒ Enable ☐ Disable

☐ Extended Fabric Mode

OK Apply Close Reset

Switch Commit Messages

Change current switch settings

Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

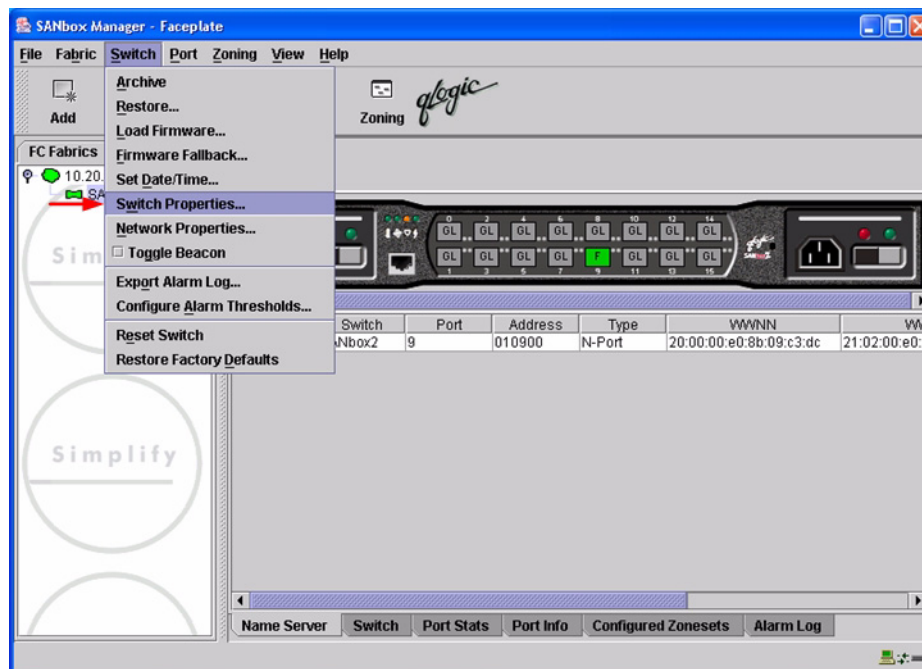
```
Login: admin
Password: xxxxxxxxx
Brocade3800:admin> switchdisable
Brocade3800:admin> configure
```

The following options display.

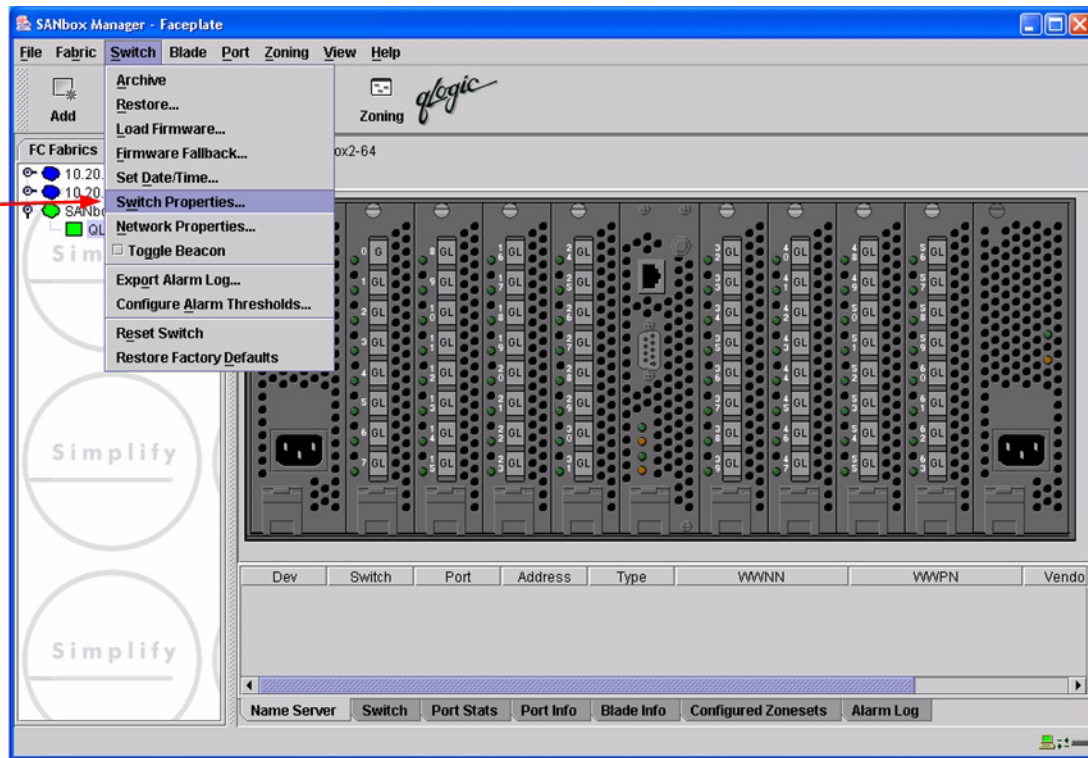
```
Fabric parameters (yes, y, no, n): [no] yes
Domain: (1-239) [98] <97-127>
BB credits: 91-27) [16]
R_A_TOV: (4000..120000) [10000]
E_D_TOV: (1000..5000) [2000]
WAN_TOV: (1000..120000) [0]
WAN_RTT_DLY_MAX: (100..5000) [200]
Data field size: (256..2112) [2112]
Sequence Level Switching: (0..1) [0]
Disable Device Probing: (0..1) [0]
Suppress Class F Traffic: (0..1) [0]
SYNC IO mode: (0..1) [0]
VC Encoded Address Mode: (0..1) [0]
Core Switch PID Format: (0..1) [1]
Per-frame Route Priority: (0..1) [0]
Long Distance Fabric: (0..1) [0]
Virtual Channel parameters (yes, y, no, n): [no]
Zoning Operation parameters (yes, y, no, n): [no]
RSCN Transmission Mode (yes, y, no, n): [no]
NS Operation Parameters (yes, y, no, n): [no]
Arbitrated Loop parameters (yes, y, no, n): [no]
System services (yes, y, no, n): [no]
Portlog events enable (yes, y, no, n): [no]
Brocade:3800:admin> switchenable
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
Operational State: online Firmware Version: V1.3-56-0
Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16

Chassis Name:

Administrative State:

Domain ID: (indicated by a red arrow)

Domain ID lock: ☒ Enable ☐ Disable (indicated by a red arrow)

Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV:
R_T_TOV:
E_D_TOV:

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
Operational State: online Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1

Chassis Name:

Administrative State:

Domain ID: (indicated by a red arrow)

Domain ID lock: ☒ Enable ☐ Disable (indicated by a red arrow)

Broadcast Support: ☒ Enable ☐ Disable

In-band Management: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV:
R_T_TOV:
E_D_TOV:

OK Close

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **admin start**

SANbox2 (admin) #> **config edit**

SANbox2 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1] **<choose a unique number>**

DomainIDLock (True / False) [False] **True**

SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [10000]

E_D_TOV (decimal value, 10-20000 msec) [2000]

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> **config save**

SANbox2 (admin) #> **config activate**

The configuration will be activated. Please confirm (y/n): [n] **y**

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

R_A_TOV = 10 seconds

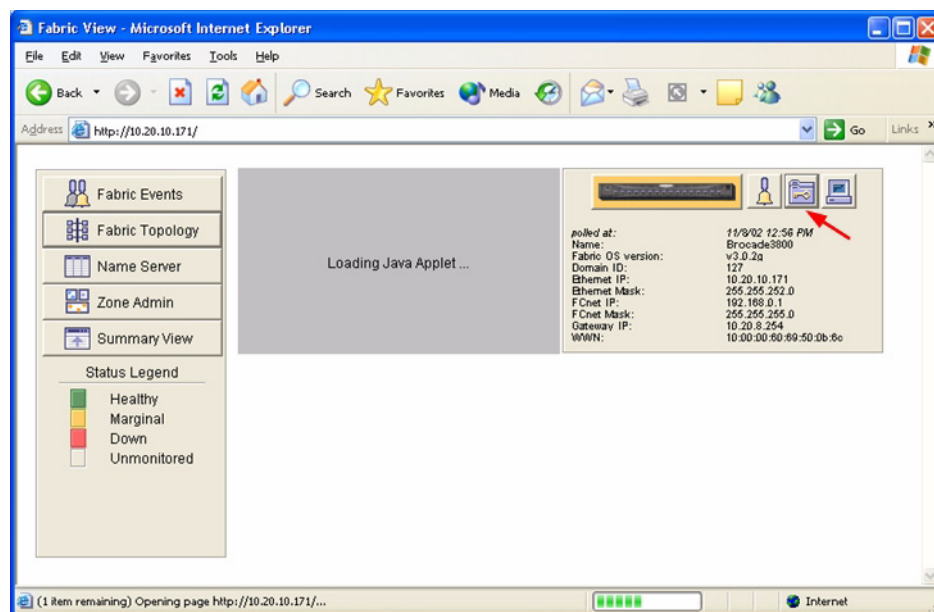
E_D_TOV = 2 seconds

This section provides the steps to change these values.

Brocade's Web Tools

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Administration** button.



3. From the **Switch Admin for Brocade** dialog box, select the **Configure** tab. Verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.

Switch Admin for Brocade - Microsoft Internet Explorer

SwitchName: brocade DomainId: 104 WWN: 10:00:00:60:69:50:10:64 Thu Dec 5 2002, 5:41 PM

Switch Settings | Network Config | Firm Upd | SNMP | Lic Admin
Report | Port Setting | User Admin | **Configure** | Routing | Extended Fabric

Fabric Parameters

BB Credit 16 R_A_TOV 10000 E_D_TOV 2000 Data Size 2112

☐ Sequence Switching ☐ Disable Device Probing ☐ Per-Frame Routing Priority

☐ VC Encoded Address Mode ☐ Suppress Class F Traffic

Virtual Channel Parameters

VC Priority 2 2 VC Priority 3 2 VC Priority 4 2
VC Priority 5 2 VC Priority 6 3 VC Priority 7 3

Arbitrated Loop Parameters

☒ Send Fan Frames
☐ Always Send RSCN
☐ Do Not Allow AL_PA 0x00

System Services

☐ rstaid ☒ rapid
☐ rusersd ☒ RLS Probing

OK Apply Close Reset

Switch Commit Messages

Configure Switch Parameters

Brocade CLI

Login: **admin**

Password: **xxxxxxxx**

Brocade3800:admin> **configshow**

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

Brocade3800:admin> **switchdisable**

Brocade3800:admin> **configure**

The following options display:

Fabric parameters (yes, y, no, n): [no] **yes**

Domain: (1-239) [98]

BB credits: 91-27) [16]

R_A_TOV: (4000..120000) [9000] **10000**

E_D_TOV: (1000..5000) [1000] **2000**

WAN_TOV: (1000..120000) [0]

WAN_RTT_DLY_MAX: (100..5000) [200]

Data field size: (256..2112) [2112]

Sequence Level Switching: (0..1) [0]

Disable Device Probing: (0..1) [0]

Suppress Class F Traffic: (0..1) [0]

SYNC IO mode: (0..1) [0]

VC Encoded Address Mode: (0..1) [0]

Core Switch PID Format: (0..1) [1]

Per-frame Route Priority: (0..1) [0]

Long Distance Fabric: (0..1) [0]

Virtual Channel parameters (yes, y, no, n): [no]

Zoning Operation parameters (yes, y, no, n): [no]

RSCN Transmission Mode (yes, y, no, n): [no]

NS Operation Parameters (yes, y, no, n): [no]

Arbitrated Loop parameters (yes, y, no, n): [no]

System services (yes, y, no, n): [no]

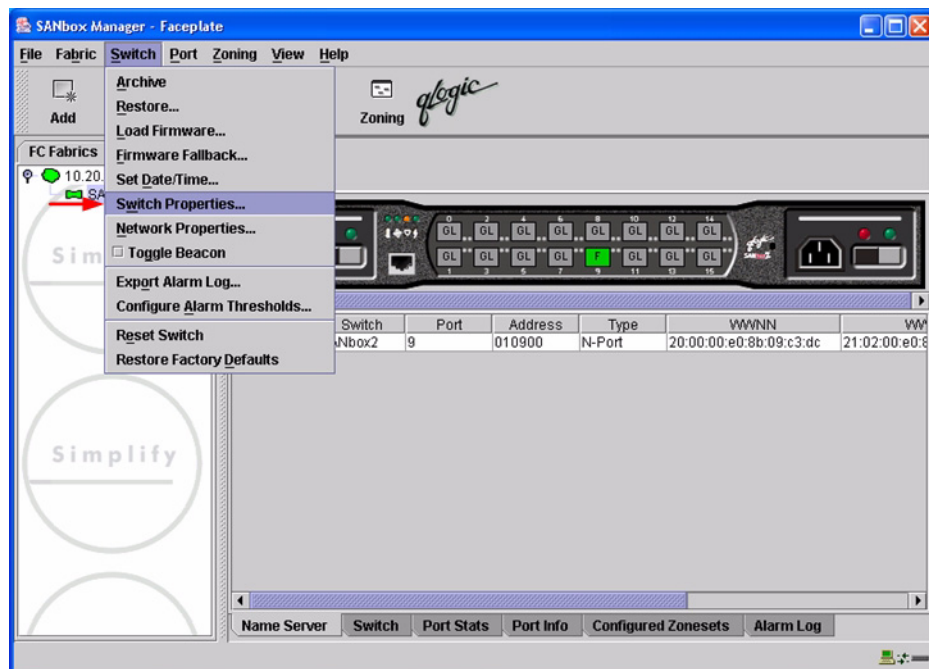
Portlog events enable (yes, y, no, n): [no]

Brocade:3800:admin> **switchenable**

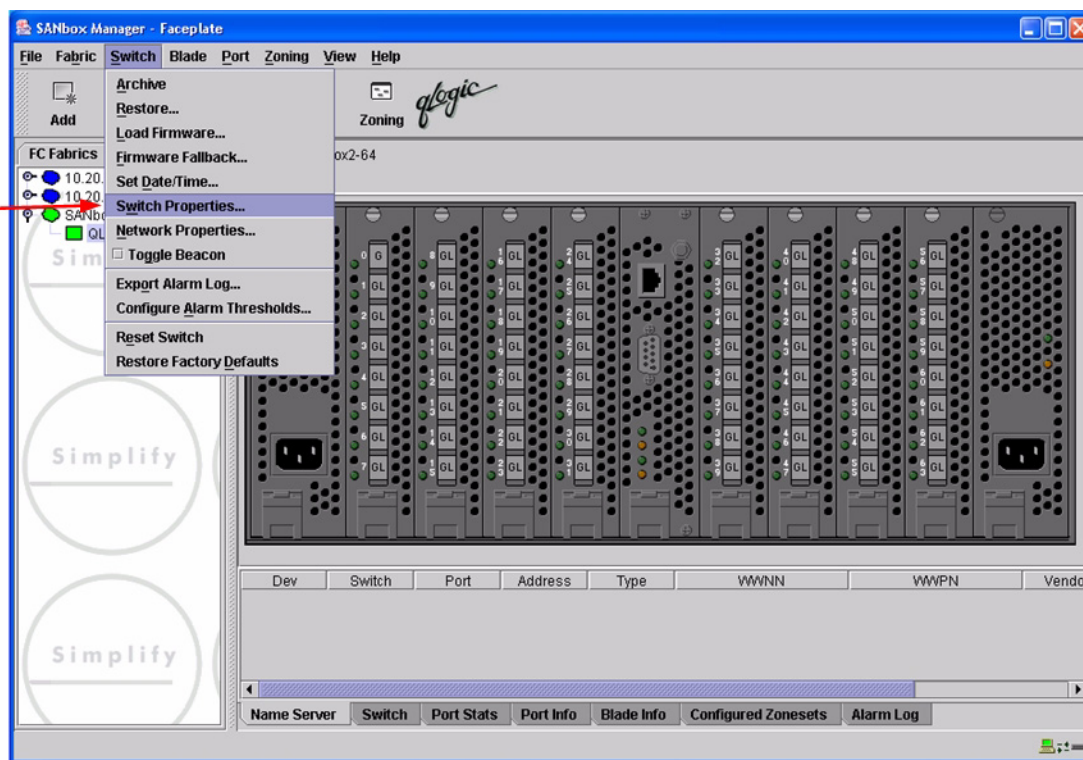
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

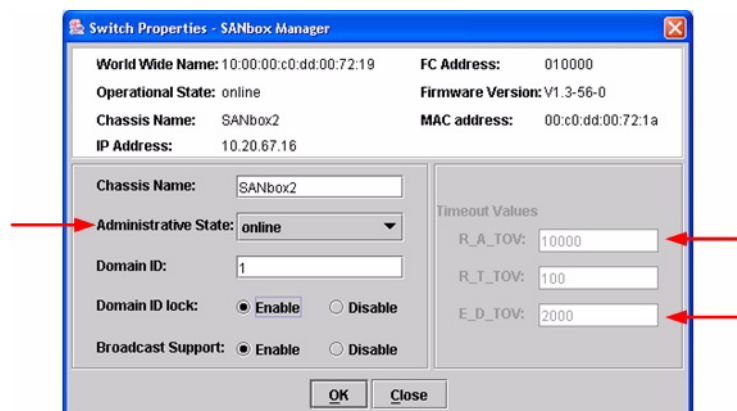


For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb	FC Address: 780000
Operational State: online	Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64	MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1	

Chassis Name: QLogic SANbox2-64

Administrative State: online

Domain ID: 120

Domain ID lock: ☒ Enable ☐ Disable

Broadcast Support: ☒ Enable ☐ Disable

In-band Management: ☒ Enable ☐ Disable

Timeout Values

R_A_TOV: 10000

R_T_TOV: 100

E_D_TOV: 2000

OK **Close**

4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

Brocade switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

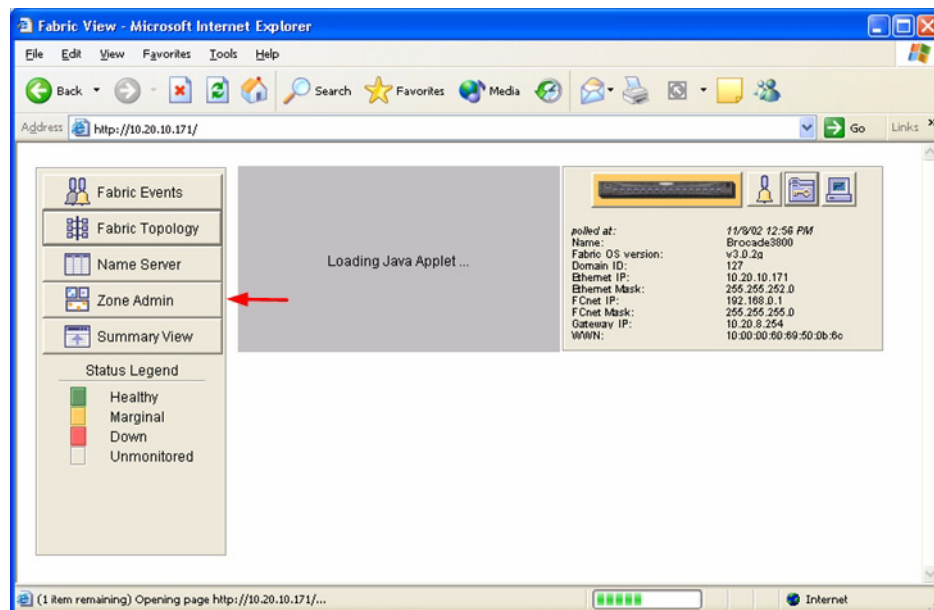
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

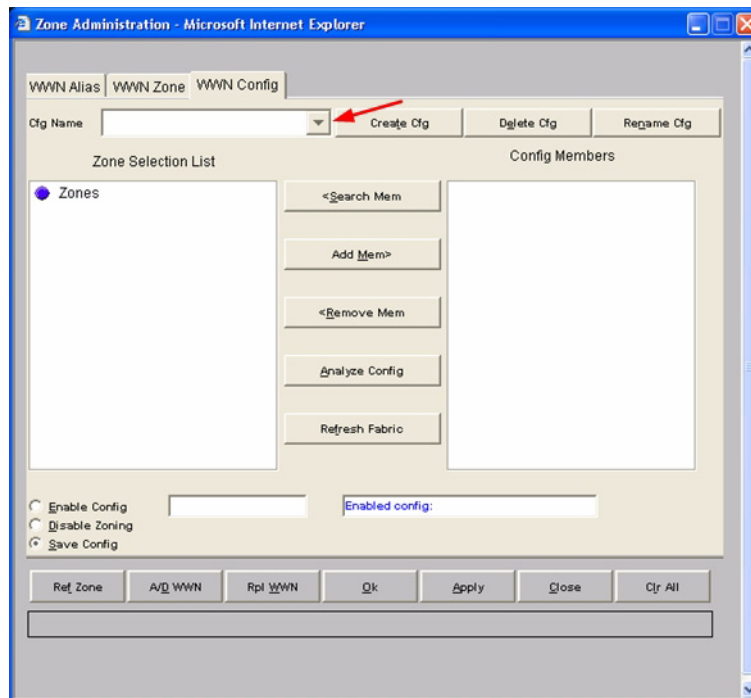
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Zone Admin** button.



3. From the **Zone Administration** dialog box, select the **WWN Config** tab. Verify that all config names conform to the standards discussed under “[Active Zone Set Names](#)” and are unique between the switches.



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

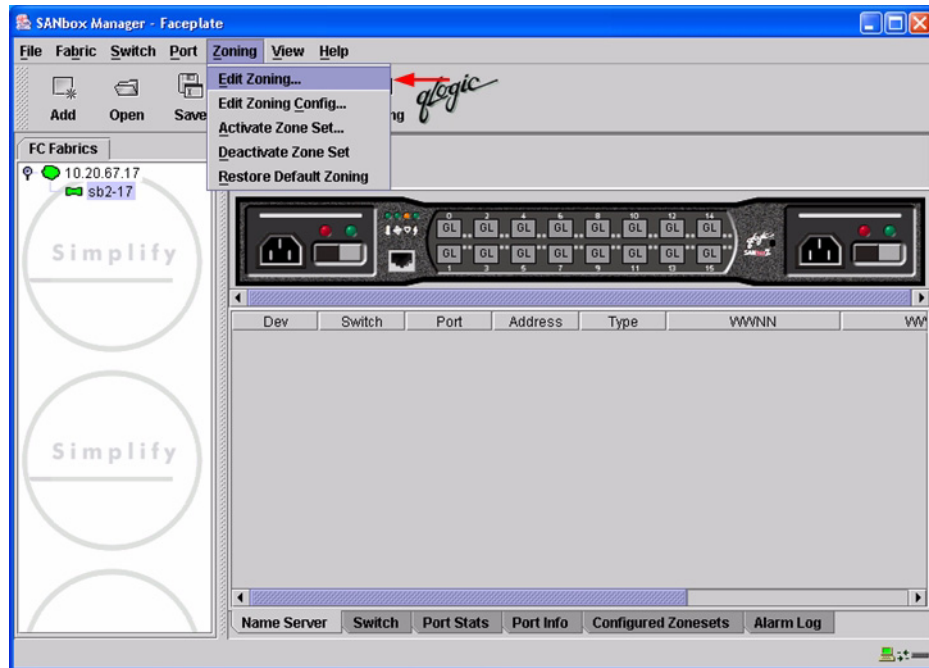
Login: **admin**

Password: **xxxxxxxx**

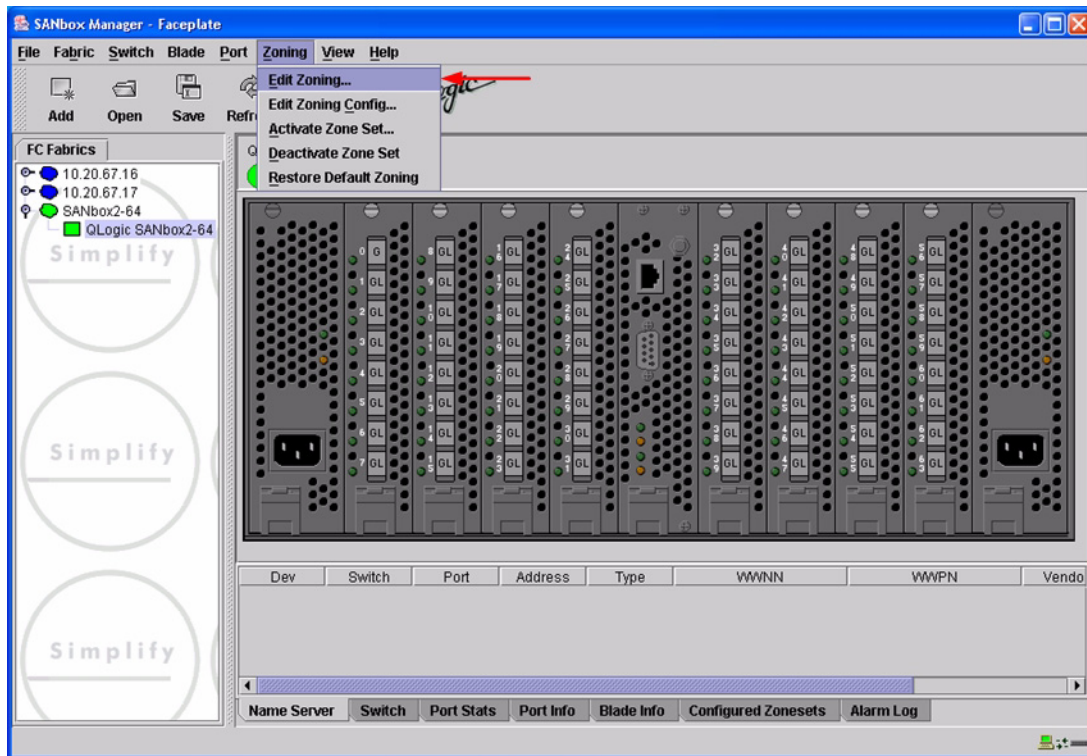
Brocade3800:admin> **cfgshow**

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

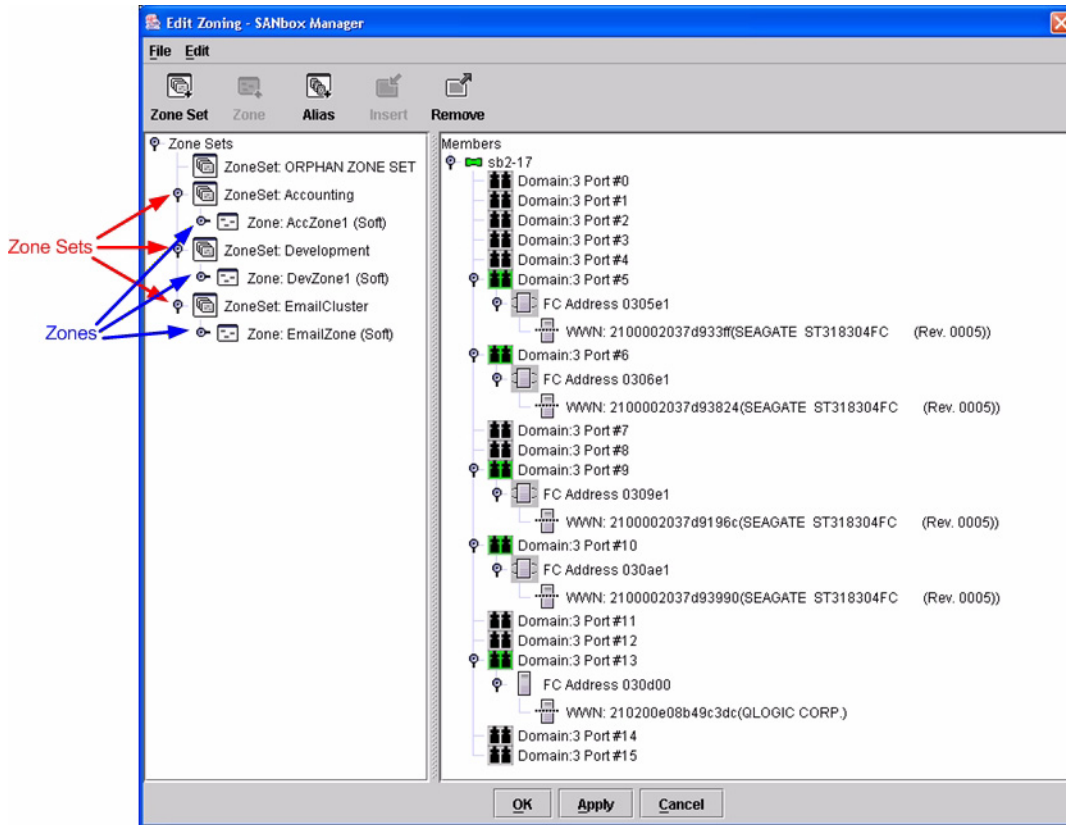


For the QLogic SANbox2-64, the following displays:

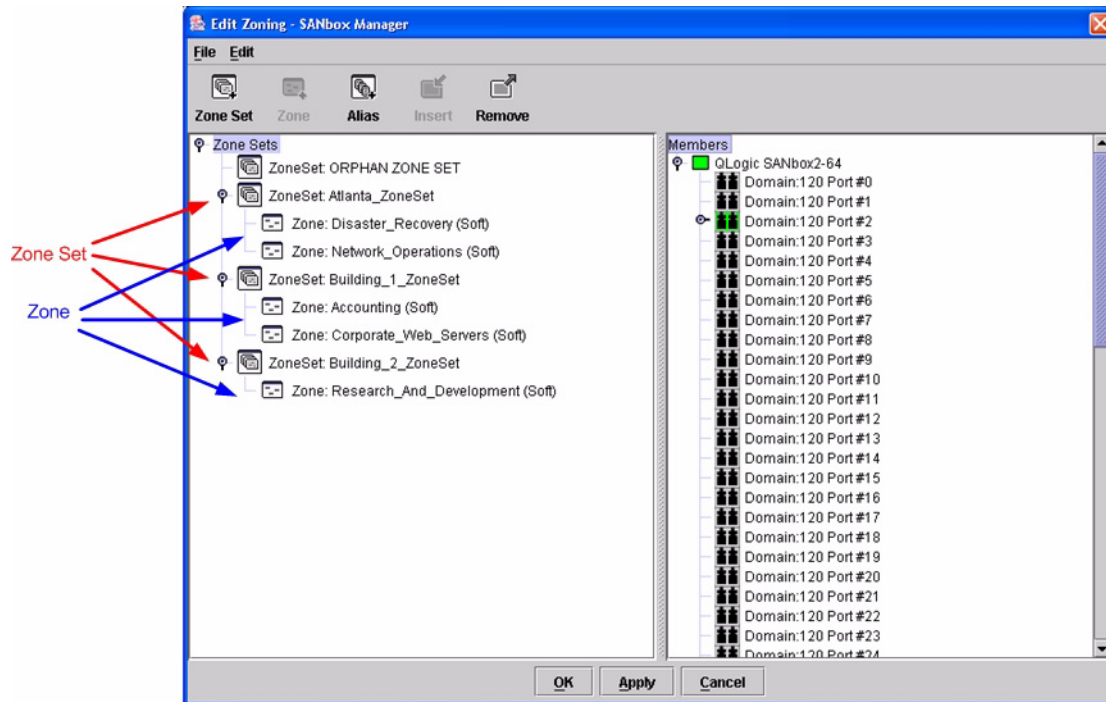


- From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 25.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

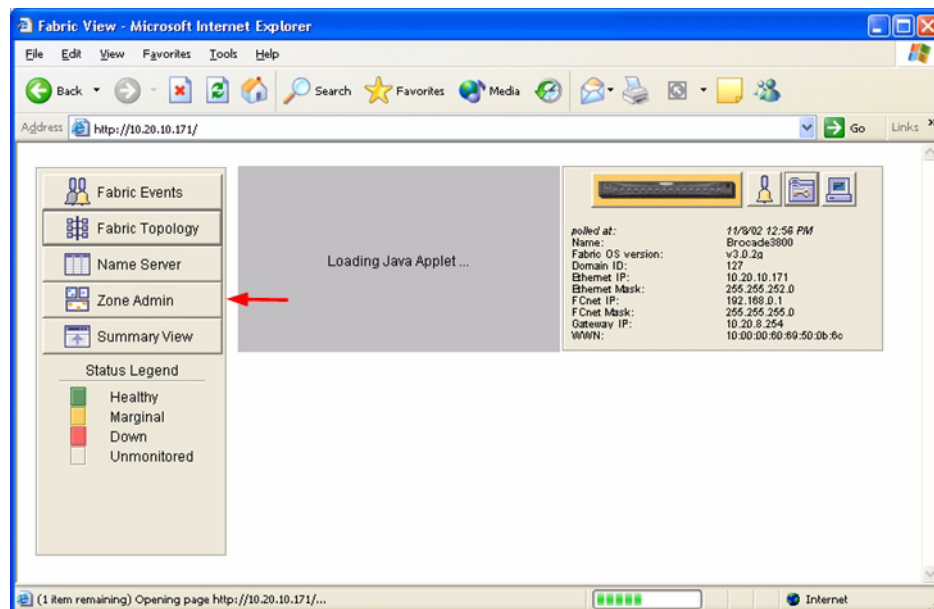
Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

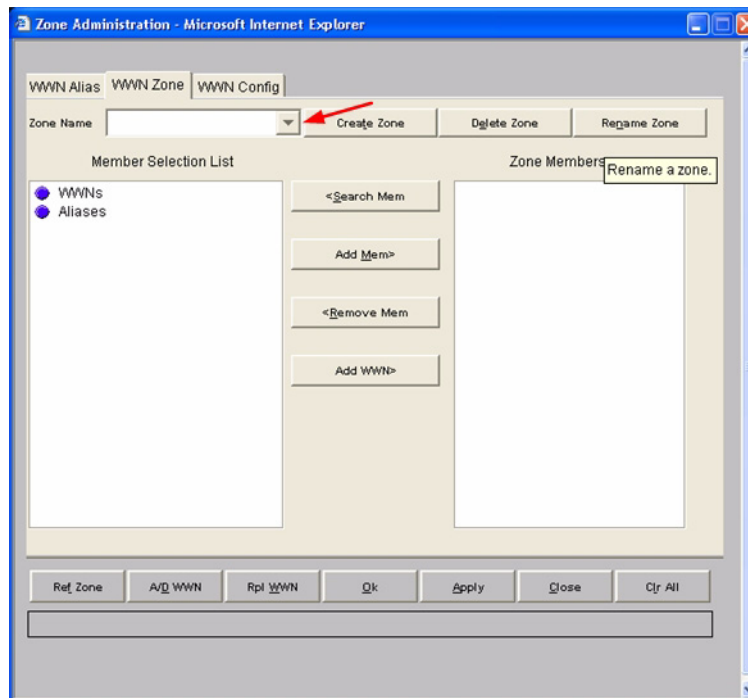
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Zone Admin** button.



3. From the **Zone Administration** dialog box, select the **WWN Zone** tab. Verify that all zone names conform to the standards discussed under “[Active Zone Set Names](#)” and are unique between the switches.



Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

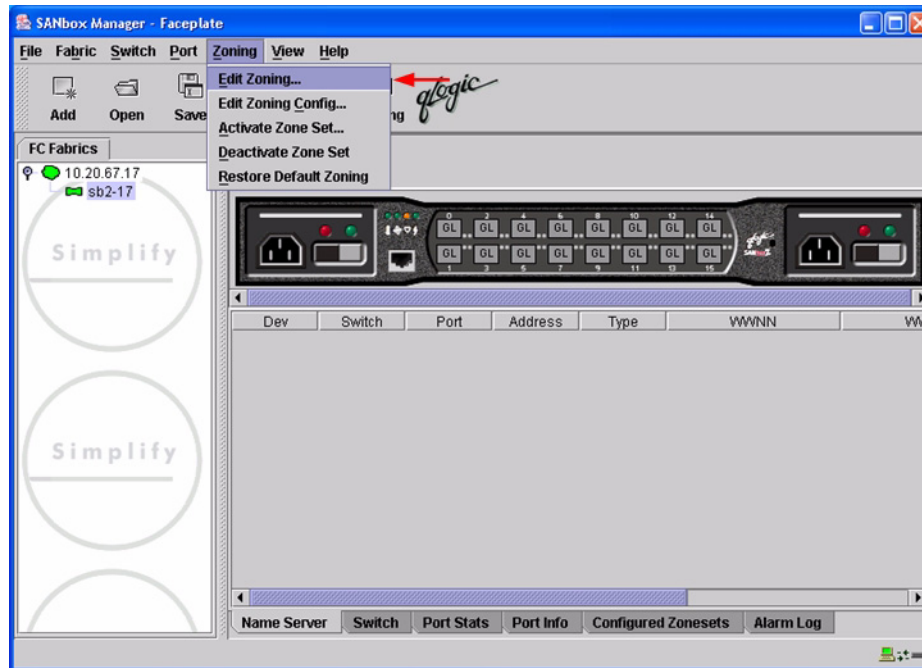
Login: **admin**

Password: **xxxxxxxx**

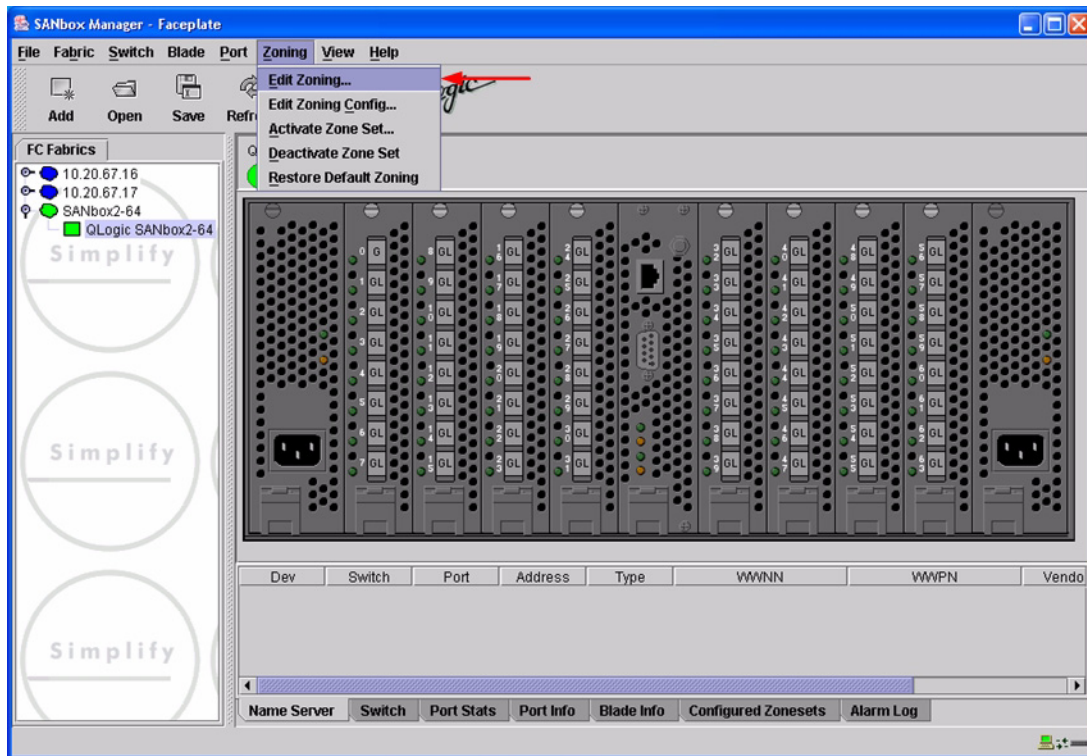
Brocade3800:admin> **zoneshow**

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

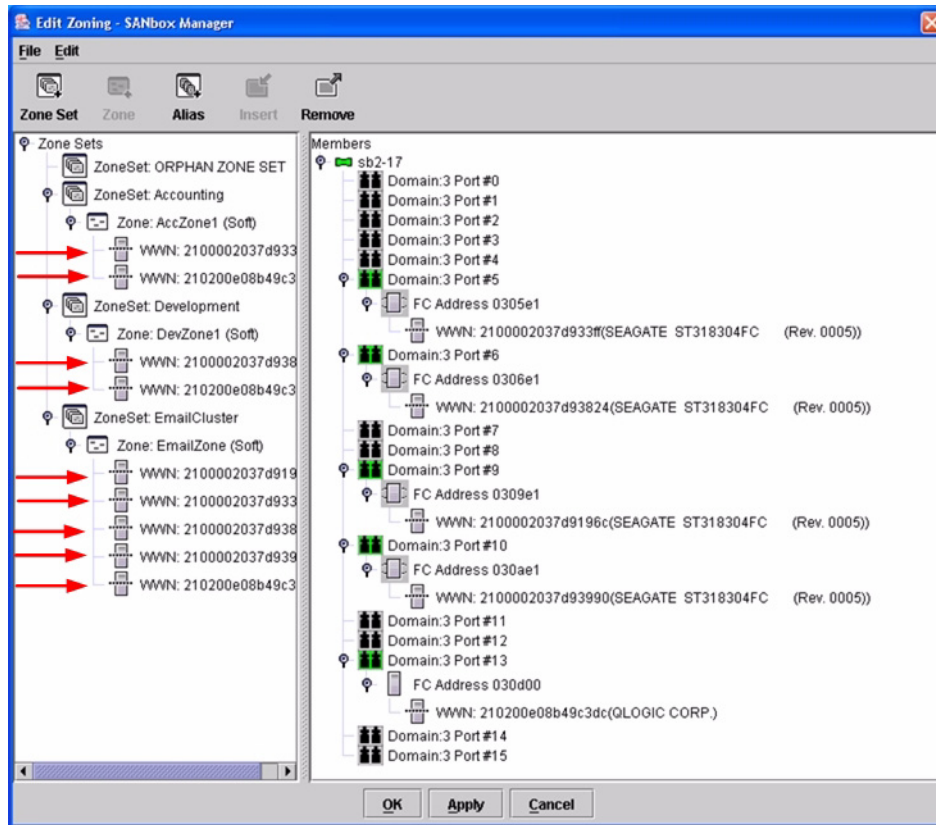


For the QLogic SANbox2-64, the following displays:

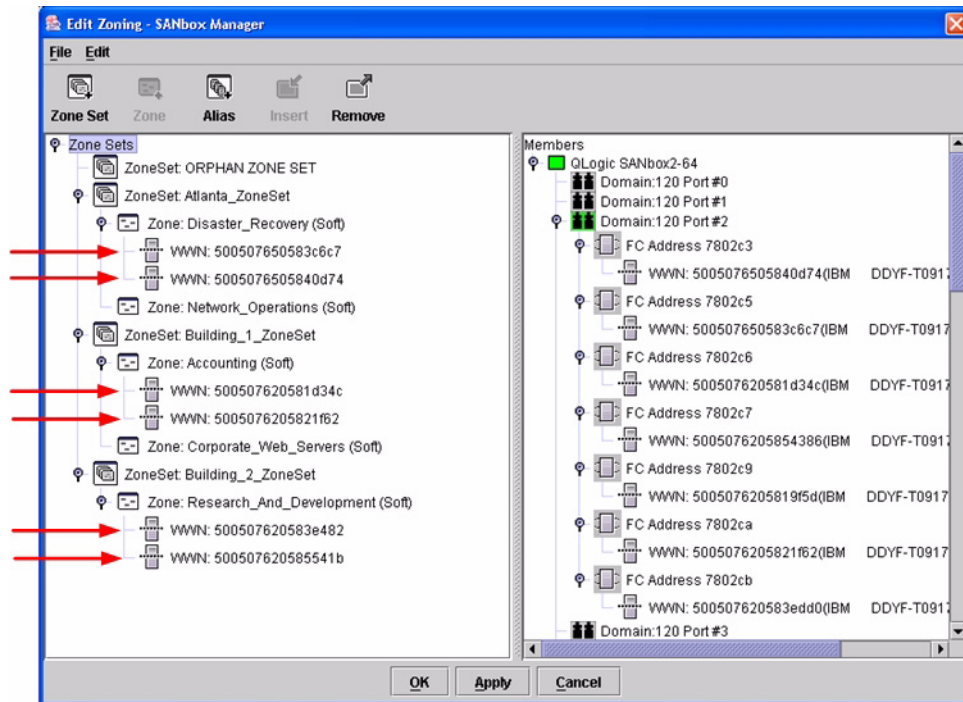


3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2#> **zone list <zone name>**

Confirm that only WWNs are listed.

Operating Mode Configuration

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

Brocade's Web Tools

Interoperability mode cannot be set using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

ATTENTION!! This procedure requires a reboot of the switch.

```
Login: admin
Password: xxxxxxxx
Brocade3800:admin> switchdisable
Brocade3800:admin> interopmode 1
    Run this command without the 1 to see its current setting.
Brocade3800:admin> fastboot
```

QLogic SANbox Manager GUI

Not applicable.

QLogic CLI

Not applicable.

Brocade Specific Configuration

The Platform Management Server must be disabled.

Brocade's Web Tools

This function cannot be done using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

```
Login: admin
Password: xxxxxxxx
Brocade3800:admin> msplmgmtdeactivate
```

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the Brocade and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

Brocade SilkWorm 3900 and SilkWorm 12000 Switches

Integration Checklist

The following steps must be completed to successfully merge Brocade and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch ([see “Supported Switches and Firmware Versions” on page 40](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range ([see “Domain ID Configuration” on page 41](#)).
 - ✓ Set all switches to the appropriate timeout values ([see “Timeout Values” on page 48](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards ([see “Active Zone Set Names” on page 55](#)).
 - ✓ Ensure that all zone members are specified by WWPN ([see “Zone Types” on page 62](#)).
 - ✓ Ensure that all Brocade switches are configured for Interoperability mode ([see “Operating Mode Configuration” on page 68](#)).
 - ✓ Ensure that Brocade’s Platform Management Server is disabled ([see “Brocade Specific Configuration” on page 68](#)).
 - ✓ Verify that the fabrics have successfully merged ([see “Successful Integration Checklist” on page 69](#)).

Configuration Limitations

The configuration limitations are as follows.

- The following Brocade software implementations may not be supported in QLogic fabrics.

NOTE: Existing Brocade switches retain all features that are available with Brocade switches once the QLogic switch is integrated into a heterogeneous fabric. Brocade features do not generate interswitch traffic. As such, they can be included in multi-vendor fabrics, but function on Brocade switches only.

- ❑ Brocade QuickLoop
- ❑ Brocade QuickLoop Fabric Assist
- ❑ Brocade Remote Switch
- ❑ Brocade Extended Fabric
- ❑ Brocade Trunking
- ❑ Brocade Advanced Performance Monitor
- ❑ Brocade Secure Fabric OS
- ❑ Brocade Fabric Services
 - ❑ Alias Server
 - ❑ Management Server
 - ❑ Platform Support
 - ❑ Virtual Channels
 - ❑ Broadcast Zones

- When merging Brocade and QLogic fabrics, a maximum of 31 switches can be configured.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from Brocade that comply with the FC-SW-2 standard.

QLogic and Brocade Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
Brocade	SilkWorm 3900 Switch	4.0.2c and above
	SilkWorm 12000 Switch	4.0.2c and above

ATTENTION!! When updating Brocade firmware, the switch may default to a proprietary operating mode. Therefore, after a firmware update, verify that the switch is still set to Interoperability mode ([see “Operating Mode Configuration” on page 68](#)).

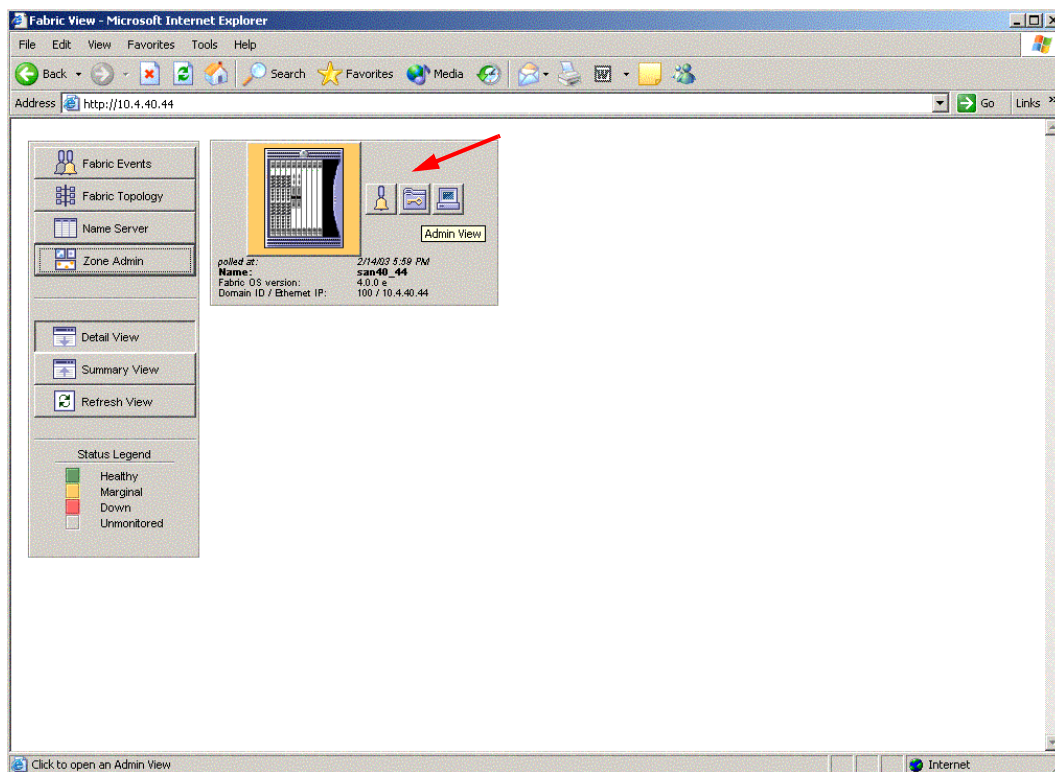
Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Brocade switch and the QLogic switch.

NOTE: The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Administration** button.



3. From the **Switch Admin for Brocade** dialog box, select the **Switch Settings** tab. Do the following:
 - a. In the **Domain ID** field, type or edit the Domain ID as appropriate.
 - b. Click **OK**.

The screenshot shows the 'Switch Admin for san40_44' window in Microsoft Internet Explorer. The window has a title bar and a menu bar. Below the menu bar, there is a status bar showing 'SwitchName: san40_44', 'DomainId: 100', 'WWN: 10:00:00:60:69:80:47:ee', and 'Fri Feb 14 2003, 6:00 PM'. The main content area has several tabs: 'Port Setting', 'Configure', 'Routing', 'Extended Fabric', 'Trunk Information', 'Switch Information', 'Network Config', 'Upload/Download', 'SNMP', and 'License Admin'. The 'Switch Information' tab is selected, and a red arrow points to the 'Domain ID' field in the 'Name and ID' section. The 'Domain ID' field contains the value '100'. Other fields include 'Name' (san40_44) and 'Serial Number' (FT02X8047EE). Below the 'Name and ID' section, there is a 'Status' section with 'Enable' and 'Disable' radio buttons, and a 'Report' section with a 'View Report' button. At the bottom of the main content area, there is a checkbox for 'Extended Fabric Mode'. At the bottom of the window, there is a status bar with a message '[Switch Administration opened]: Fri Feb 14 2003, 6:00 PM' and a 'done' button.

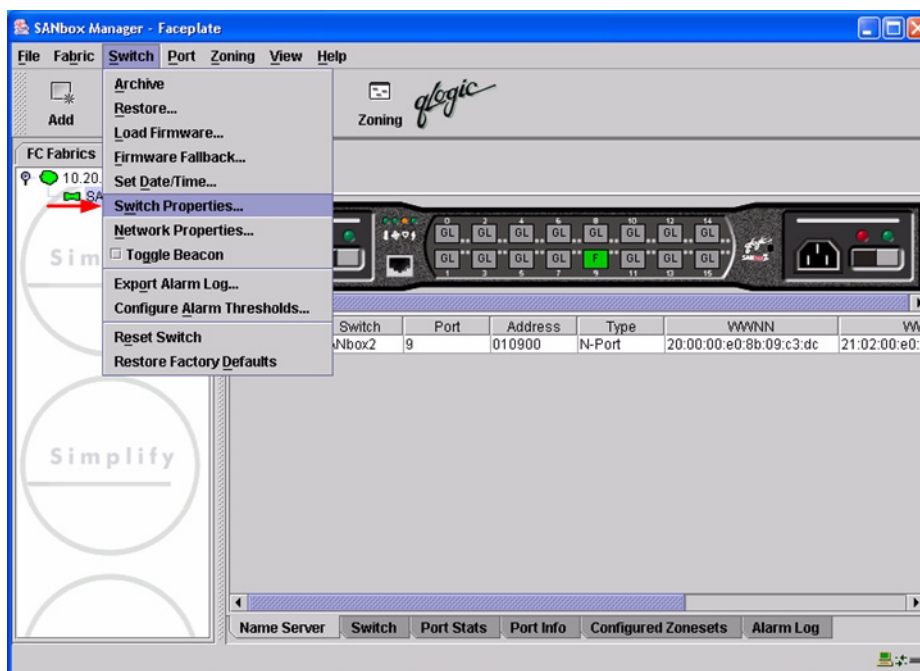
Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

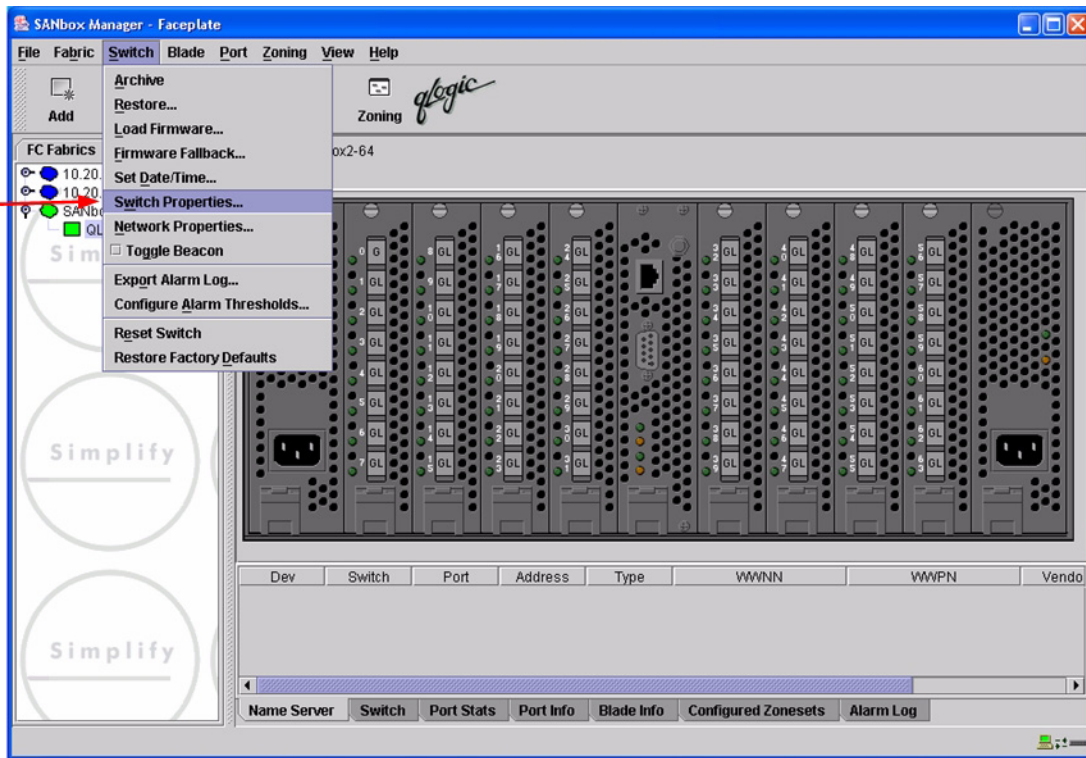
```
Fabric OS (cp1)
cp1 login: admin
Password:
Brocade12000:admin> switchdisable
Brocade12000:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no] yes
Domain: (97..127) [100]
R_A_TOV: (4000..120000) [10000]
E_D_TOV: (1000..5000) [2000]
Data field size: (256..2112) [2112]
Sequence Level Switching: (0..1) [0]
Disable Device Probing: (0..1) [0]
Suppress Class F Traffic: (0..1) [0]
VC Encoded Address Mode: (0..1) [0]
Per-frame Route Priority: (0..1) [0]
BB credit: (1..16) [16]
Virtual Channel parameters (yes, y, no, n): [no]
Zoning Operation parameters (yes, y, no, n): [no]
RSCN Transmission Mode (yes, y, no, n): [no]
NS Operation Parameters (yes, y, no, n): [no]
Arbitrated Loop parameters (yes, y, no, n): [no]
System services (yes, y, no, n): [no]
Portlog events enable (yes, y, no, n): [no]
No changes.
Brocade12000:admin> switchenable
10 Brocade12000:admin> 9 8 7 6 5 4 3 2 1
fabric: Principal switch
fabric: Domain 100
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
Operational State: online Firmware Version: V1.3-56-0
Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16

Chassis Name: SANbox2
Administrative State: online
Domain ID: 1
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
Operational State: online Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1

Chassis Name: QLogic SANbox2-64
Administrative State: online
Domain ID: 120
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable
In-band Management: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
```

```
Password: xxxxxxxx
```

```
SANbox2 #> admin start
```

```
SANbox2 (admin) #> config edit
```

```
SANbox2 (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
```

```
BroadcastEnabled (True / False) [True]
```

```
InbandEnabled (True / False) [True]
```

```
DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
```

```
DomainIDLock (True / False) [False] True
```

```
SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]
```

```
R_T_TOV (decimal value, 1-1000 msec) [100]
```

```
R_A_TOV (decimal value, 100-100000 msec) [10000]
```

```
E_D_TOV (decimal value, 10-20000 msec) [2000]
```

```
FS_TOV (decimal value, 100-100000 msec) [5000]
```

```
DS_TOV (decimal value, 100-100000 msec) [5000]
```

```
PrincipalPriority (decimal value, 1-255) [254]
```

```
ConfigDescription (string, max=64 chars) [Default Config]
```

```
SANbox2 (admin-config) #> config save
```

```
SANbox2 (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

R_A_TOV = 10 seconds

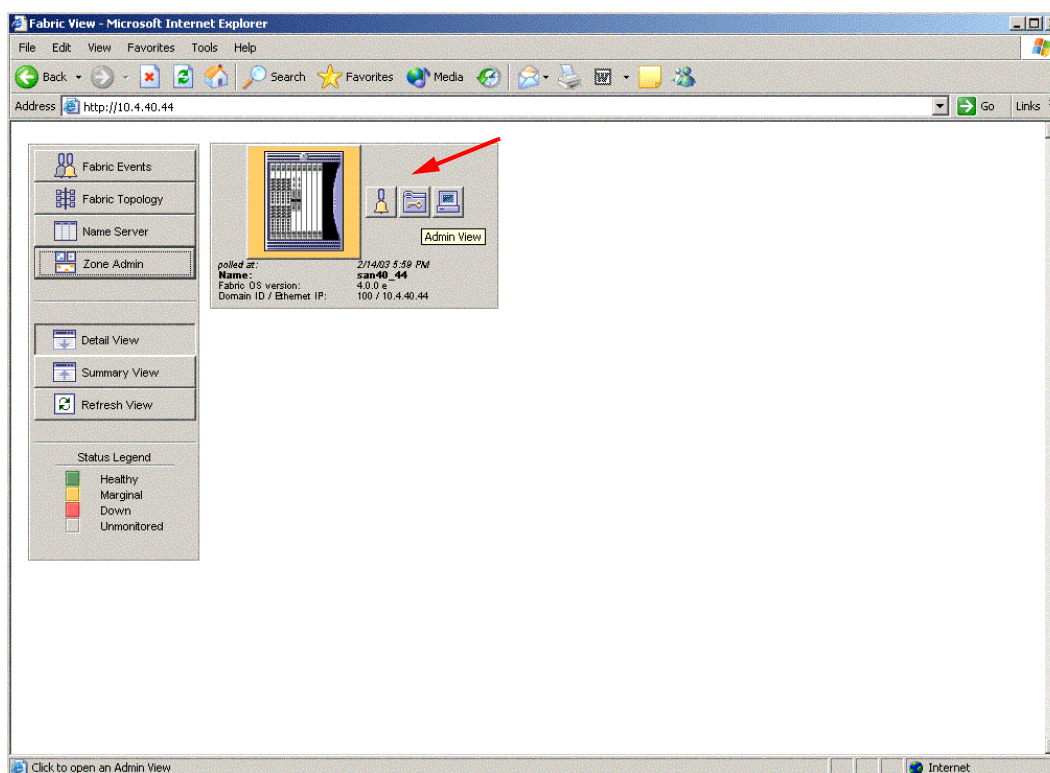
E_D_TOV = 2 seconds

This section provides the steps to change these values.

Brocade's Web Tools

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Administration** button.



3. From the **Switch Admin for Brocade** dialog box, select the **Configure** tab. Verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.

Switch Admin for san40_44 - Microsoft Internet Explorer

SwitchName: san40_44 DomainId: 100 WWN: 10:00:00:60:69:80:47:ee Fri Feb 14 2003, 6:01 PM

Port Setting **Configure** Routing Extended Fabric Trunk Information

Switch Information Network Config Upload/Download SNMP License Admin

Fabric Parameters

BB Credit: 16

R_A_TOV: 10000

E_D_TOV: 2000

Datafield Size: 2112

Sequence Level Switching ☐

Disable Device Probing ☐

Per-Frame Routing Priority ☐

VC Encoded Address Mode ☐

Suppress Class F Traffic ☐

Fabric **Virtual Channel** Arbitrated Loop System

OK Apply Close Reset Refresh

[Switch Administration opened]: Fri Feb 14 2003, 6:00 PM

done

Brocade CLI

```
Fabric OS (cp1)
cp1 login: admin
Password: xxxxxxxx
Brocade12000:admin> configshow
```

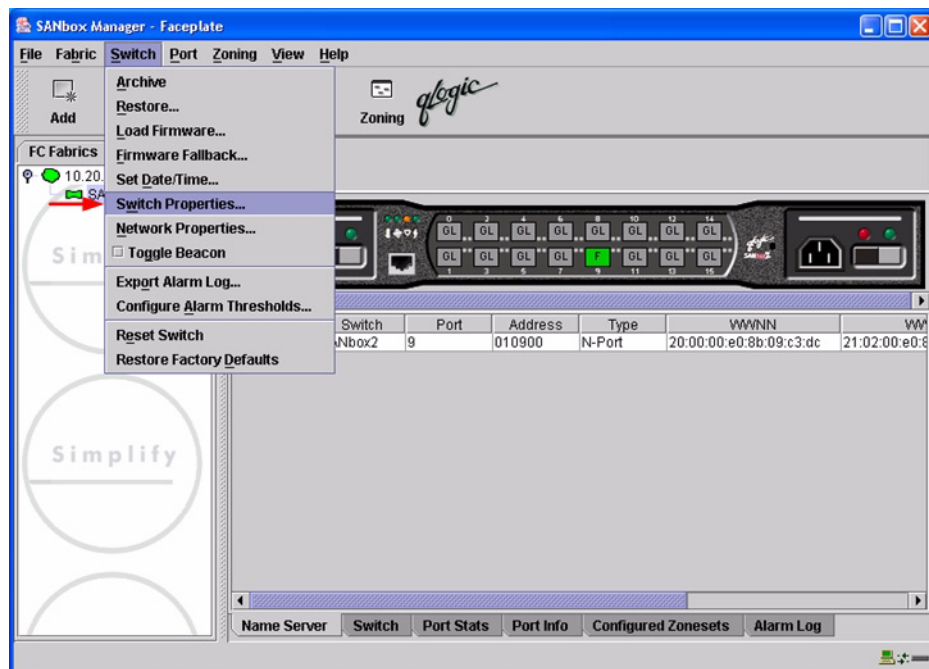
Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Brocade12000:admin> switchdisable
Brocade12000:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no] yes
Domain: (97..127) [100]
R_A_TOV: (4000..120000) [10000]
E_D_TOV: (1000..5000) [2000]
Data field size: (256..2112) [2112]
Sequence Level Switching: (0..1) [0]
Disable Device Probing: (0..1) [0]
Suppress Class F Traffic: (0..1) [0]
VC Encoded Address Mode: (0..1) [0]
Per-frame Route Priority: (0..1) [0]
BB credit: (1..16) [16]
Virtual Channel parameters (yes, y, no, n): [no]
Zoning Operation parameters (yes, y, no, n): [no]
RSCN Transmission Mode (yes, y, no, n): [no]
NS Operation Parameters (yes, y, no, n): [no]
Arbitrated Loop parameters (yes, y, no, n): [no]
System services (yes, y, no, n): [no]
Portlog events enable (yes, y, no, n): [no]
Brocade12000:admin> switchenable
10 Brocade12000:admin> 9 8 7 6 5 4 3 2 1
fabric: Principal switch
fabric: Domain 100
```

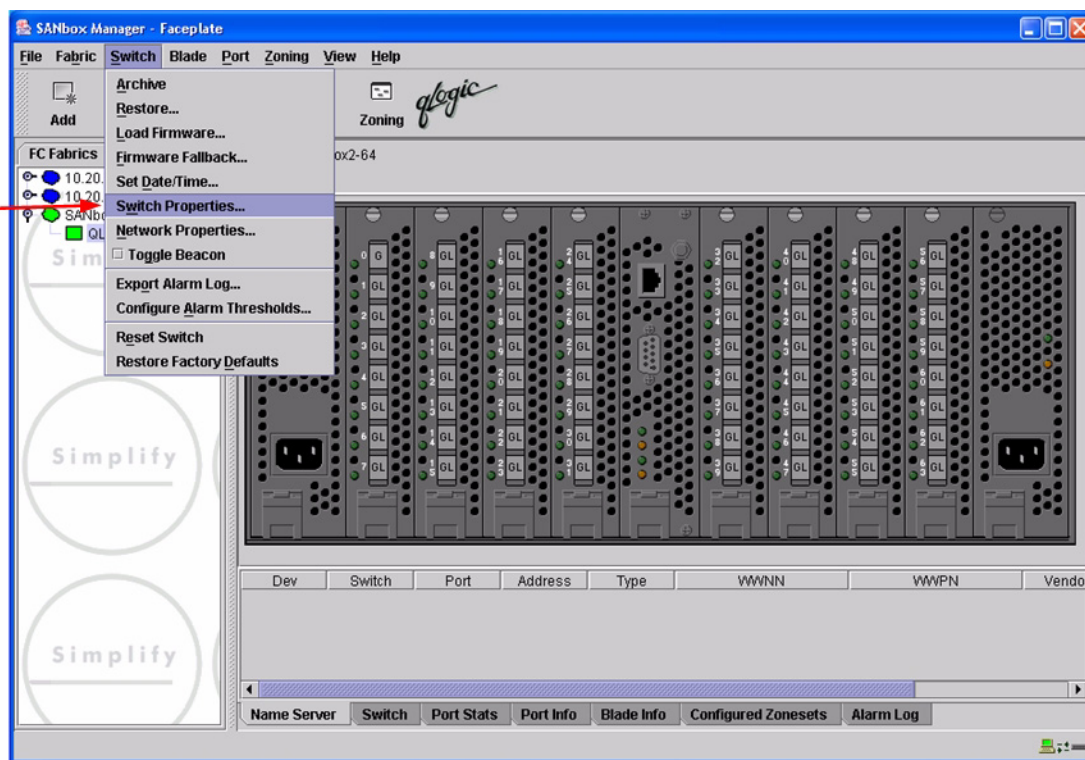
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

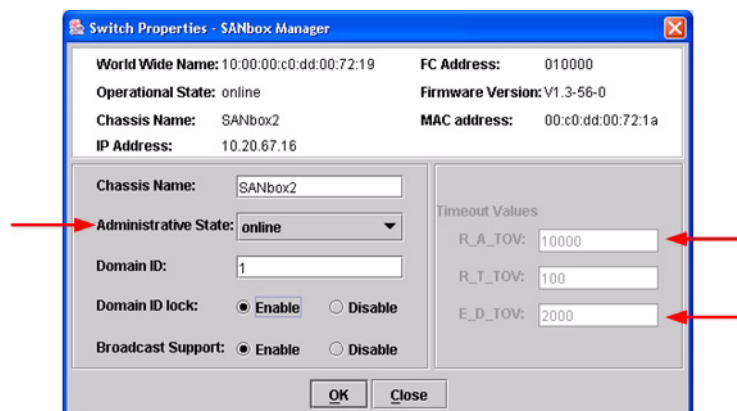


For the QLogic SANbox2-64, the following displays:

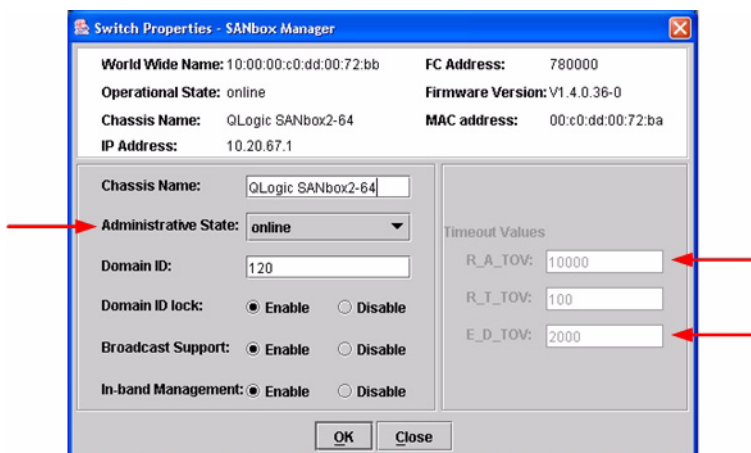


3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

Brocade switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

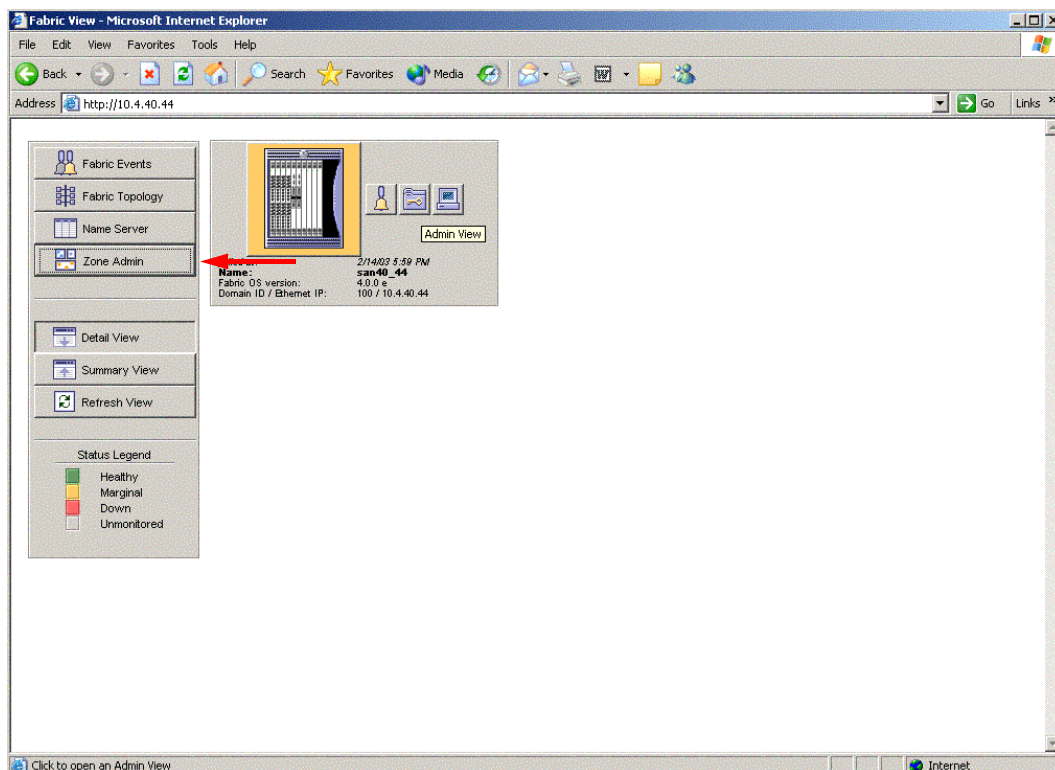
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

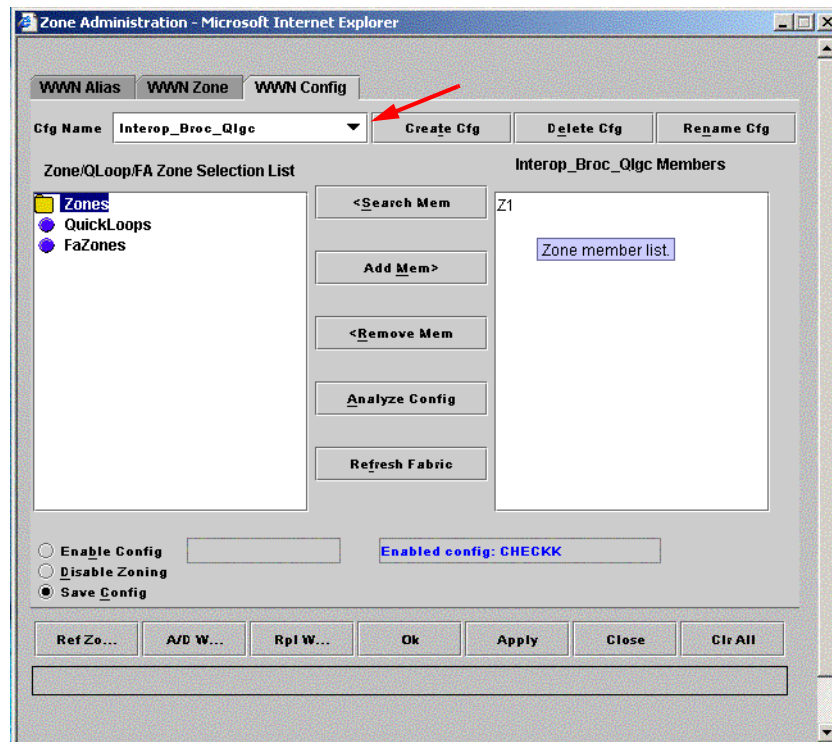
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Zone Admin** button.



3. From the **Zone Administration** dialog box, select the **WWN Config** tab. Verify that all config names conform to the standards discussed under “[Active Zone Set Names](#)” on page 55 and are unique between the switches.



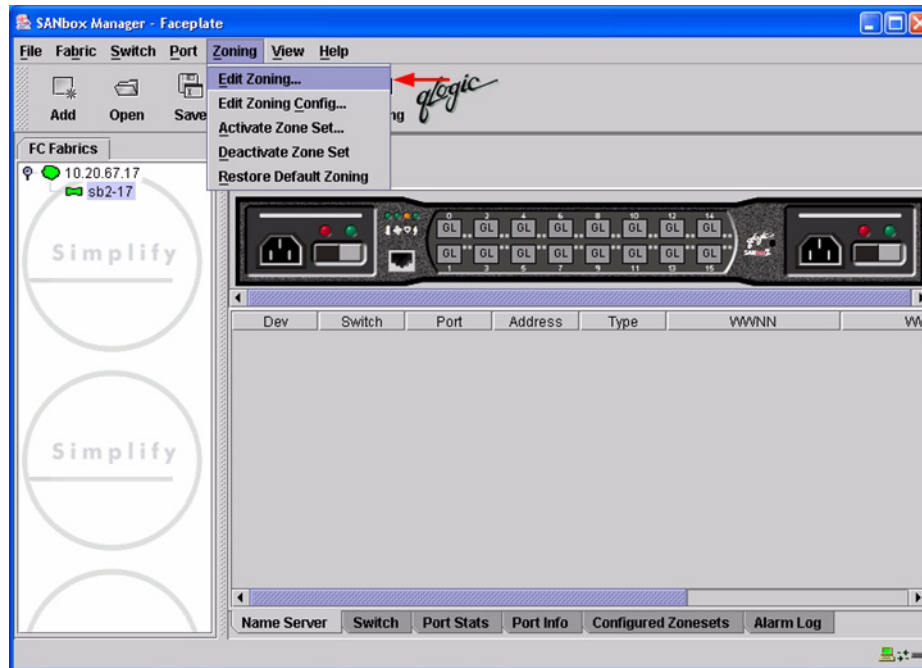
Brocade CLI

NOTE: Use the following CLI commands when Brocade's Web tools are not available.

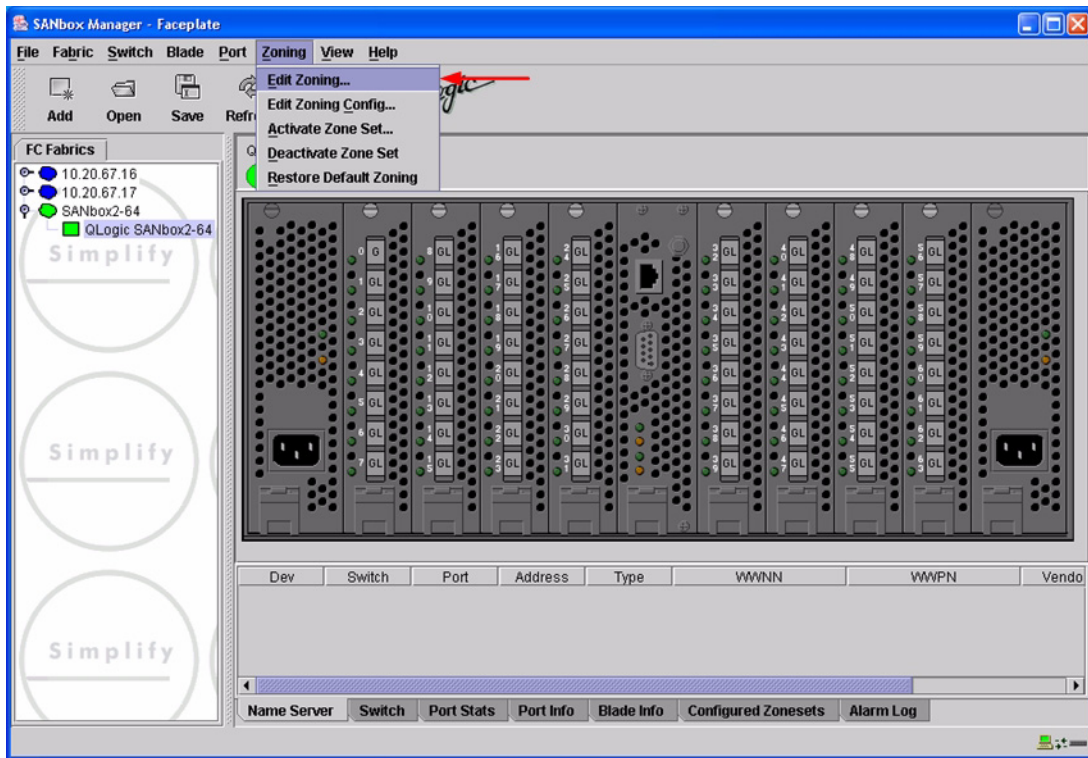
```
Fabric OS (cp1)
cp1 login: admin
Password: xxxxxxxx
Brocade12000:admin> cfgshow
Defined configuration:
    cfg: Interop_Broc_Qlgc
        Z1
zone:    Z1      21:00:00:e0:8b:06:01:e6; 21:00:00:e0:8b:06:00:e6;
          21:00:00:e0:8b:06:04:e6; 21:00:00:e0:8b:06:99:67;
          50:02:0f:23:00:00:03:58
Effective configuration:
    cfg: CHECKK
zone:    Z1      21:00:00:e0:8b:06:01:e6
          21:00:00:e0:8b:06:00:e6
          21:00:00:e0:8b:06:04:e6
          21:00:00:e0:8b:06:99:67
          50:02:0f:23:00:00:03:58
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

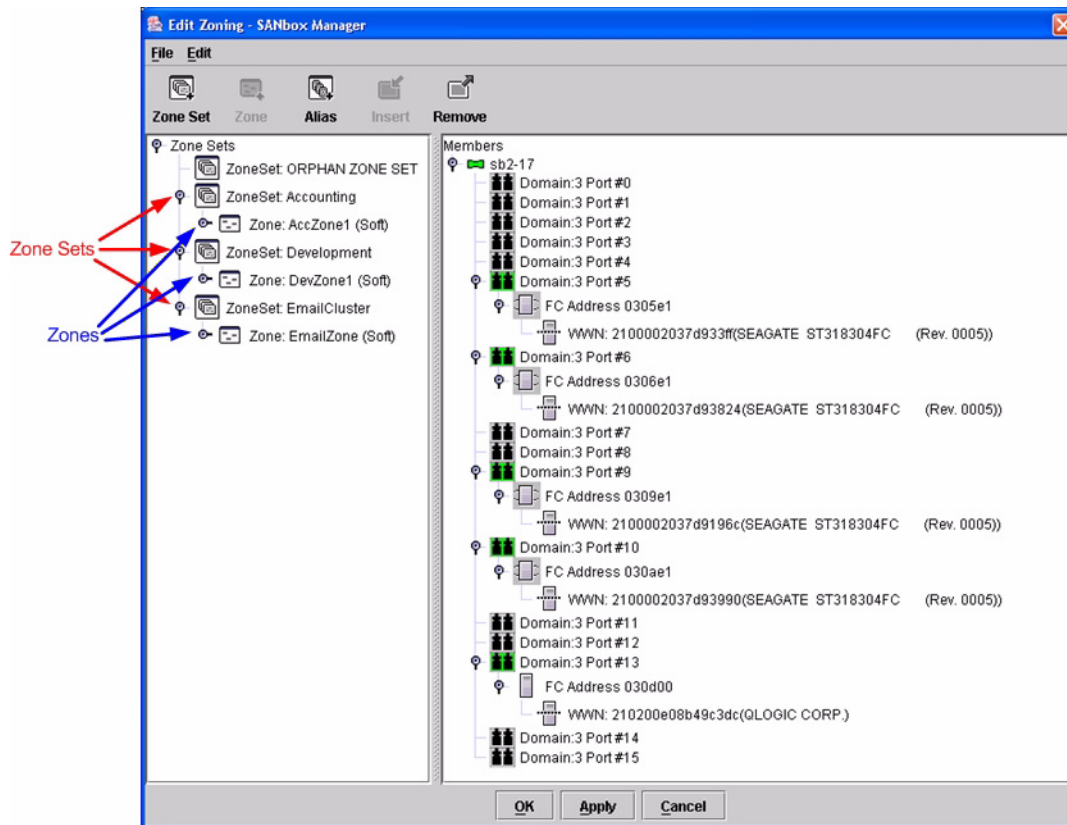


For the QLogic SANbox2-64, the following displays:

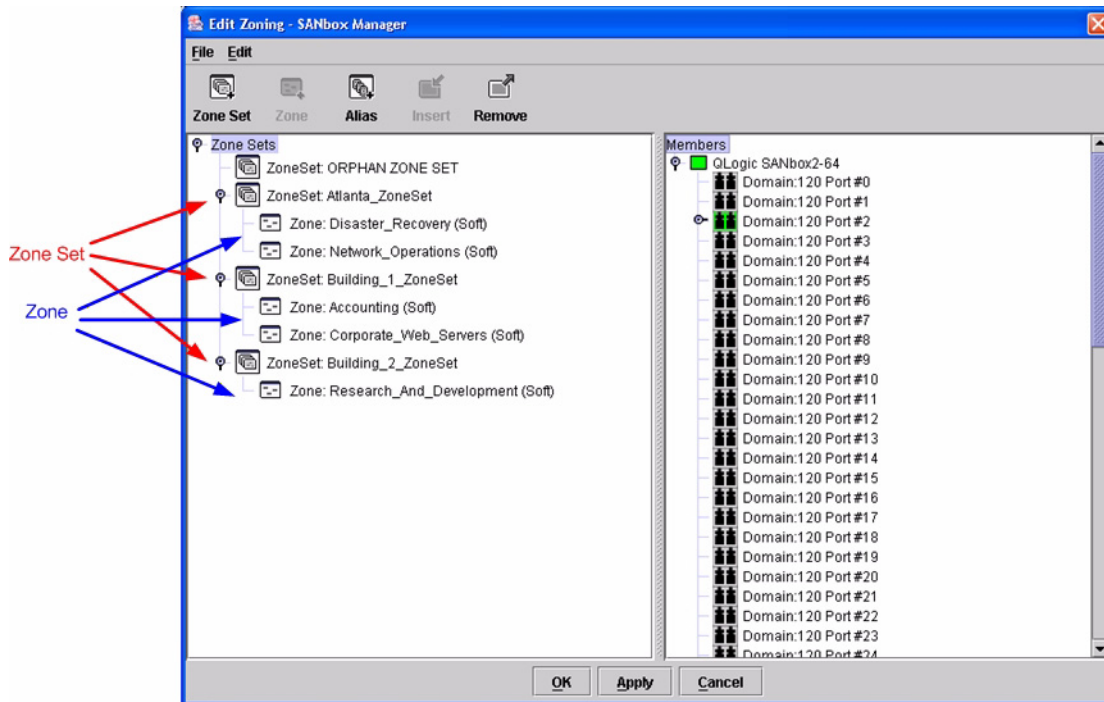


3. From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 55.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

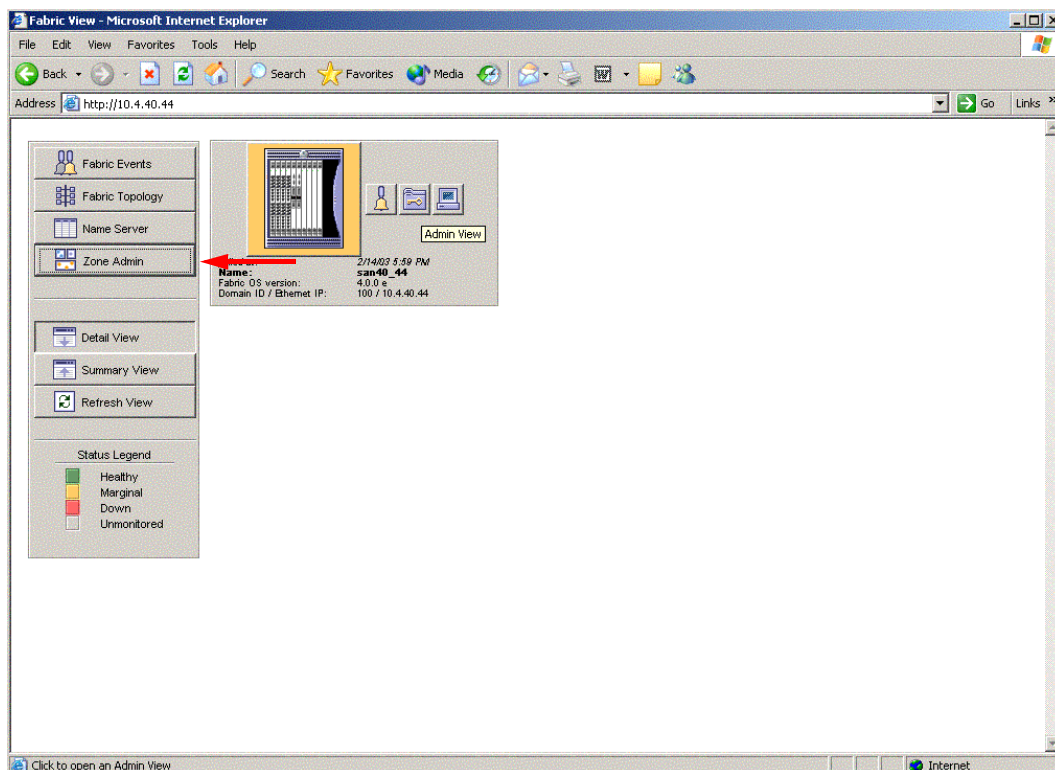
Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

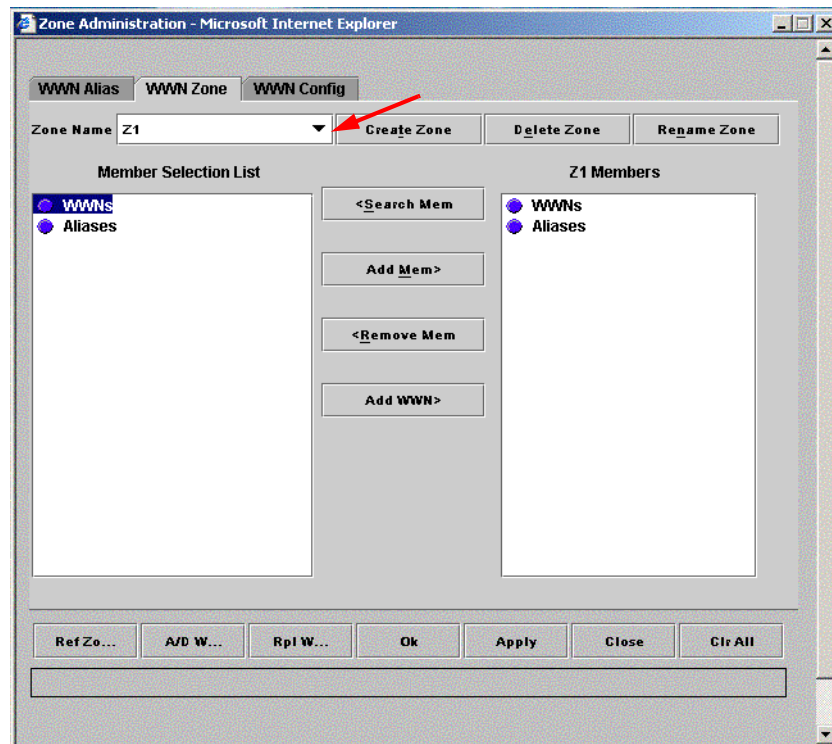
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

Brocade's Web Tools

1. Start Brocade's Web Tools. The **Fabric View** dialog box displays.
2. From the **Fabric View** dialog box, click the **Zone Admin** button.



- From the **Zone Administration** dialog box, select the **WWN Zone** tab. Verify that all zone names conform to the standards discussed under [“Active Zone Set Names” on page 55](#) and are unique between the switches.

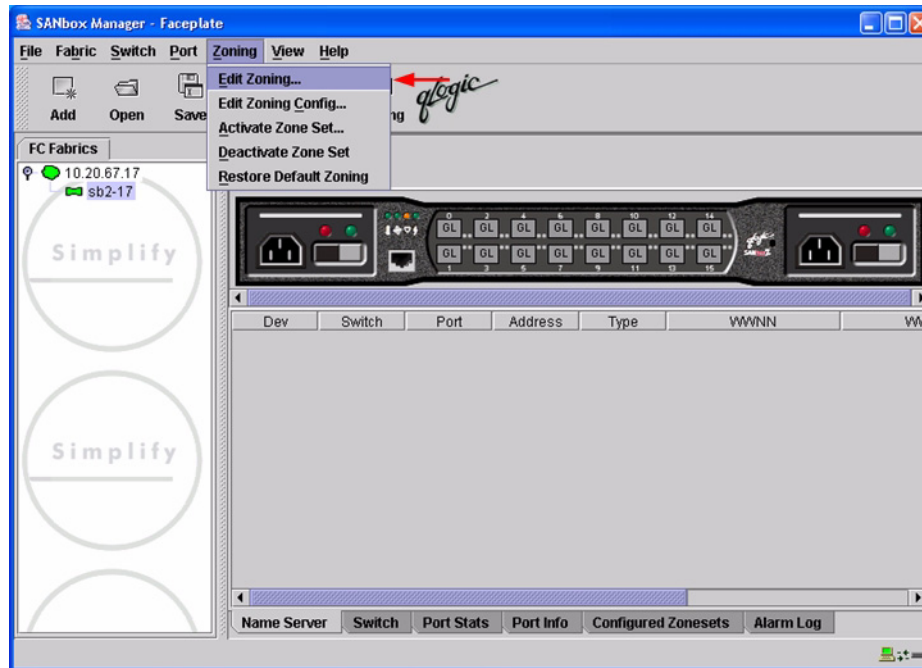


Brocade CLI

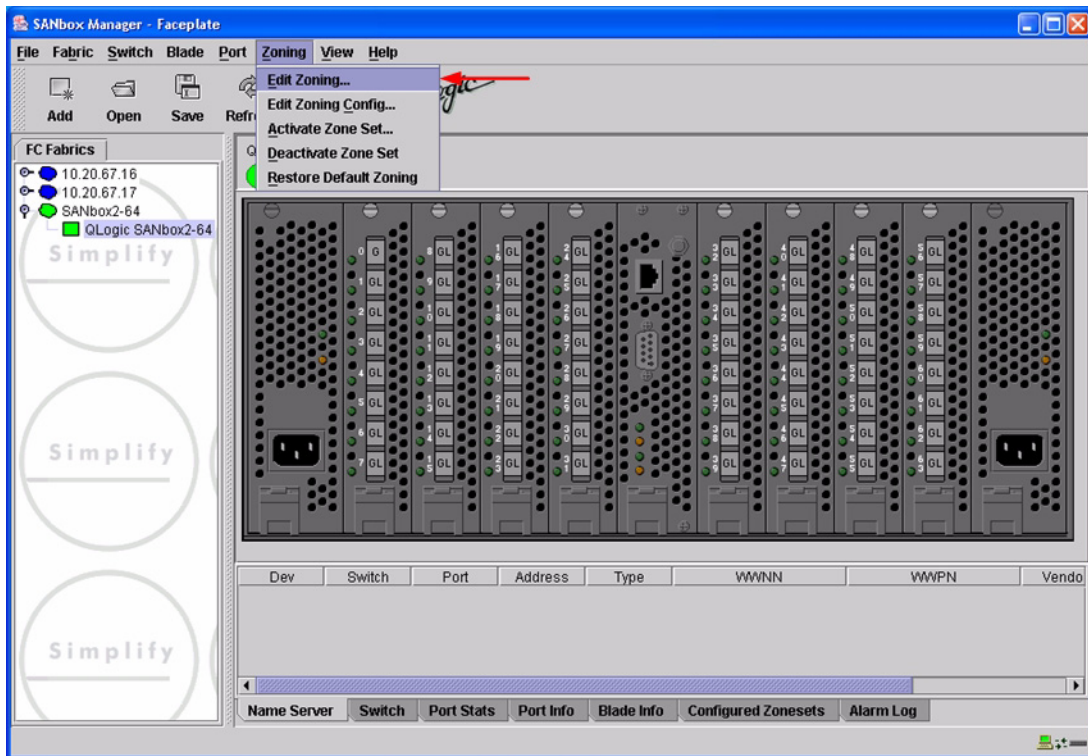
```
Login: admin
Password: xxxxxxxx
Brocade12000:admin> zonestow
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

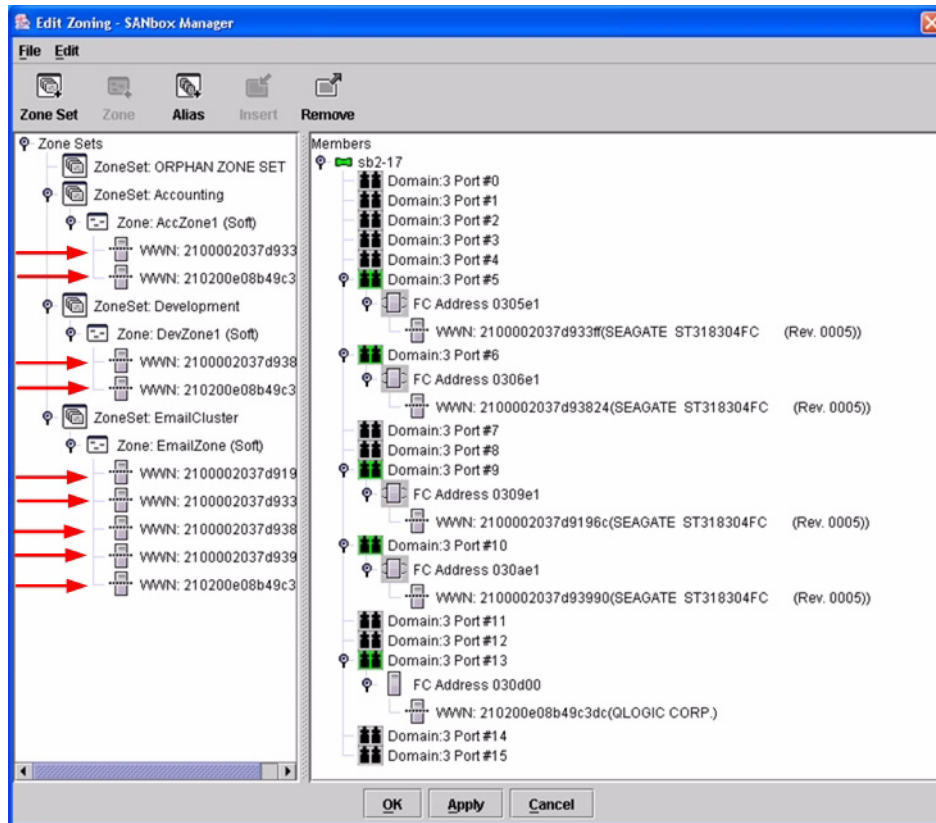


For the QLogic SANbox2-64, the following displays:

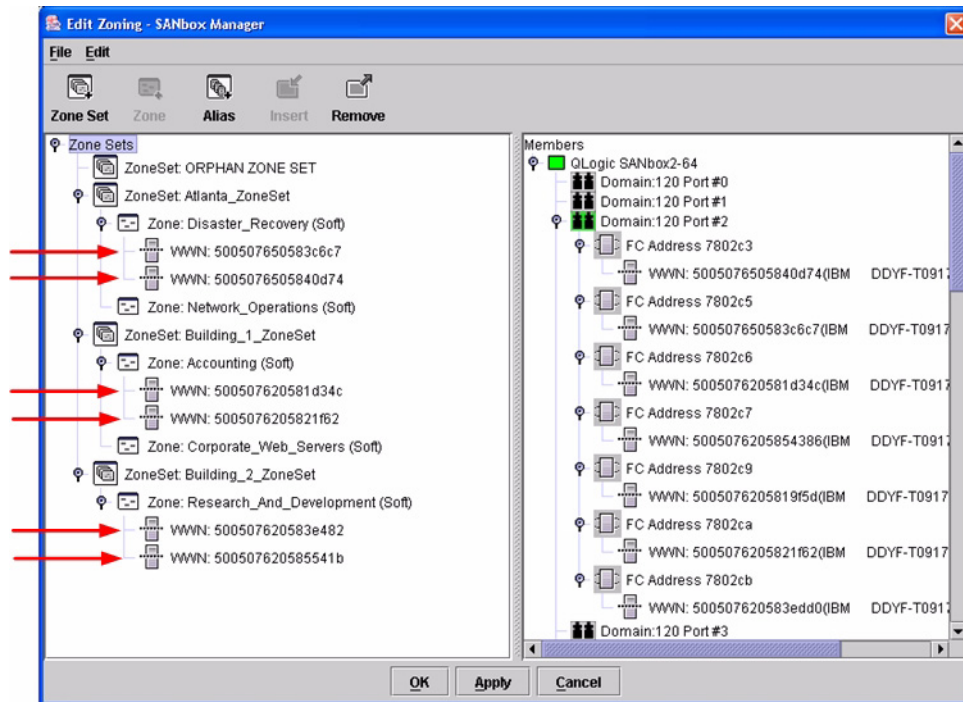


3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2#> **zone list <zone name>**

Confirm that only WWNs are listed.

Operating Mode Configuration

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

Brocade's Web Tools

Interoperability mode cannot be set using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

The Brocade switch must be in Interoperability mode to be FC-SW2 compliant.

ATTENTION!! This procedure requires a reboot of the switch.

```
Login: admin
Password: xxxxxxxx
Brocade12000:admin> switchdisable
Brocade12000:admin> interopmode 1
    Run this command without the 1 to see its current setting.
Brocade12000:admin> fastboot
```

QLogic SANbox Manager GUI

Not applicable.

QLogic CLI

Not applicable.

Brocade Specific Configuration

The Platform Management Server must be disabled.

Brocade's Web Tools

This function cannot be done using Brocade's Web Tools; use the Brocade CLI.

Brocade CLI

```
Login: admin
Password: xxxxxxxx
Brocade12000:admin> msplmgmtdeactivate
```

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the Brocade and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

Merging QLogic and Cisco Fabrics

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from Cisco that comply with the FC-SW-2 standard.

QLogic and Cisco Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8	1.3.x and above
	SANbox2-16	1.3.x and above
	SANbox2-64	1.5.x and above
Cisco	SN 5428 Storage Router	2.3.1-k9 or above
	MDS 9216 Switch	1.0(1) [build 1.0(0.281)]
	MDS 9509 Director	1.0(1) [build 1.0(0.281)]

The following chapters provide detailed information about merging QLogic and Cisco fabrics:

- **Cisco SN 5428 Storage Router** ([see page 73](#))
- **Cisco MDS 9000 Series Switches** ([see page 93](#))

Cisco SN 5428 Storage Router

Integration Checklist

The following steps must be completed to successfully merge Cisco and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch ([see “Supported Switches and Firmware Versions” on page 74](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range ([see “Domain ID Configuration” on page 75](#)).
 - ✓ Set all switches to the appropriate timeout values ([see “Timeout Values” on page 81](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards ([see “Active Zone Set Names” on page 86](#)).
 - ✓ Ensure that Zoning Merge type is set to SW2 ([see “Cisco Specific Configuration” on page 91](#)).
 - ✓ Verify that the fabrics have successfully merged ([see “Successful Integration Checklist” on page 92](#)).

Configuration Limitations

No limitations exist when merging Cisco and QLogic fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switch from Cisco that complies with the FC-SW-2 standard.

QLogic and Cisco Supported Switch and Firmware Versions

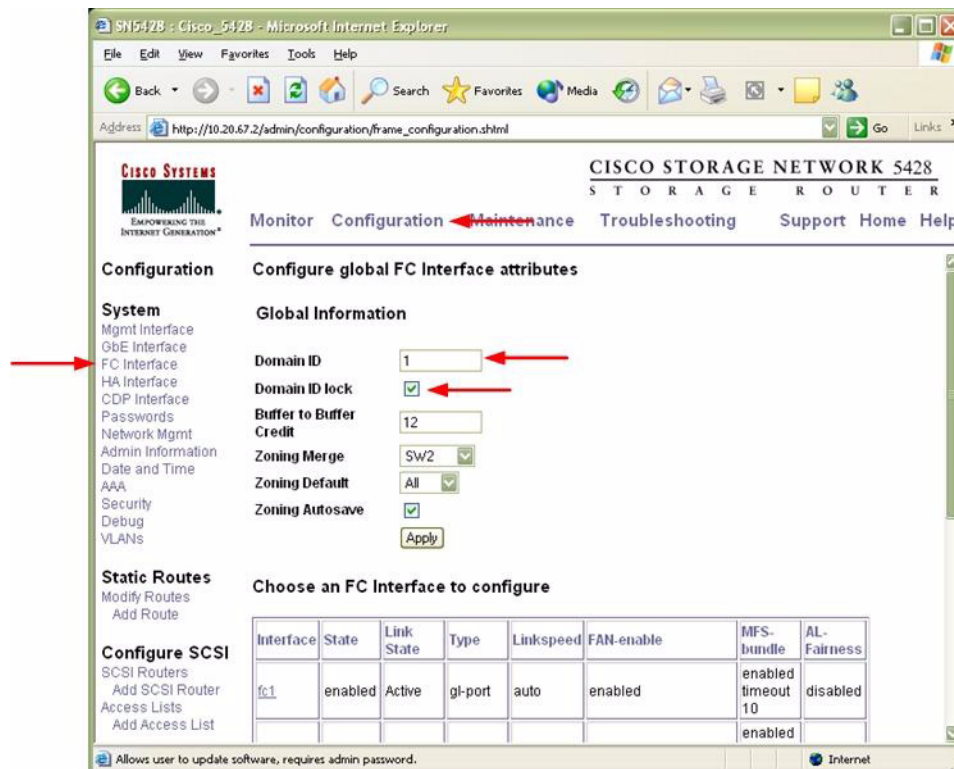
Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
Cisco	SN 5428 Storage Router	2.3.1-k9 or above

Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Cisco switch and the QLogic switch.

Cisco SN 5428 Management Interface

1. Start the Cisco SN 5428 Management Interface. The **Cisco Storage Network 5428 Storage Router** dialog box displays.
2. From the **Cisco Storage Network 5428 Storage Router** dialog box, do the following:
 - a. Select the primary link **Configuration**.
 - b. From the function link **System**, click **FC Interface**.
 - c. In the **Global Information Domain ID** box, type or edit the Domain ID as appropriate.
 - d. Select the **Global Information Domain ID Lock** check box.
 - e. Click **Apply**.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco SN 5428 Management Interface is not available.

ATTENTION!! This procedure requires a reboot of the switch.

```
CISCO SN 5428 Storage Router
```

```
Password: *****
```

```
[Cisco_5428]$ ena
```

```
Enter admin password: *****
```

```
[Entering Administrator mode]
```

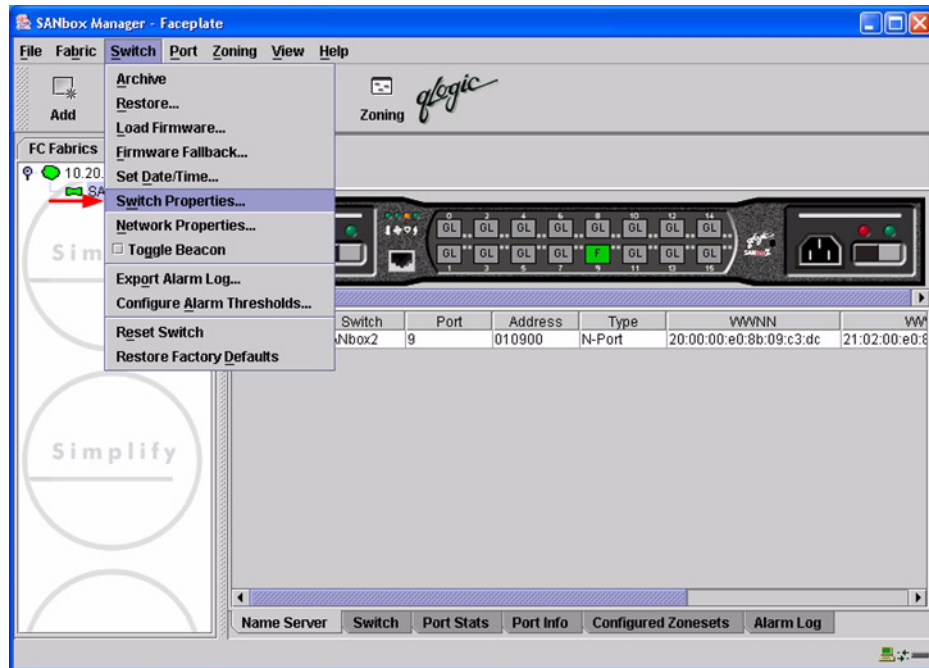
```
[Cisco_5428]# interface fc domainid <domain id>
```

```
[Cisco_5428]# interface fc domainid lock enable
```

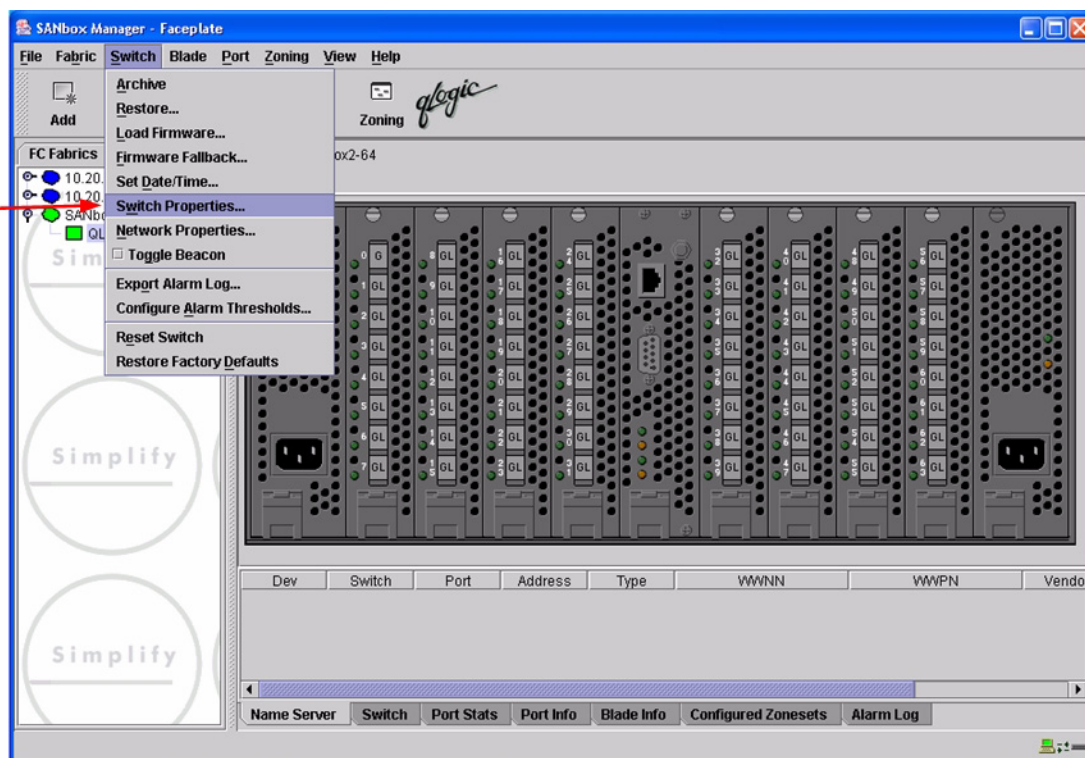
```
*[Cisco_5428]# save all bootconfig
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
 Operational State: online Firmware Version: V1.3-56-0
 Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
 IP Address: 10.20.67.16

Chassis Name:
 Administrative State:
 Domain ID:
 Domain ID lock: ☒ Enable ☐ Disable
 Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
 R_A_TOV:
 R_T_TOV:
 E_D_TOV:

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
 Operational State: online Firmware Version: V1.4.0.36-0
 Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
 IP Address: 10.20.67.1

Chassis Name:
 Administrative State:
 Domain ID:
 Domain ID lock: ☒ Enable ☐ Disable
 Broadcast Support: ☒ Enable ☐ Disable
 In-band Management: ☒ Enable ☐ Disable

Timeout Values
 R_A_TOV:
 R_T_TOV:
 E_D_TOV:

OK Close

Qlogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **admin start**

SANbox2 (admin) #> **config edit**

SANbox2 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1] **<choose a unique number>**

DomainIDLock (True / False) [False] **True**

SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [10000]

E_D_TOV (decimal value, 10-20000 msec) [2000]

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> **config save**

SANbox2 (admin) #> **config activate**

The configuration will be activated. Please confirm (y/n): [n] **y**

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

R_A_TOV = 10 seconds

E_D_TOV = 2 seconds

This section provides the steps to change these values.

NOTE: Timeout values cannot be set using the Cisco SN 5428 Management Interface nor the Cisco CLI. Use the QLogic SANbox Manager GUI or QLogic CLI.

Cisco SN 5428 Management Interface

Not applicable.

Cisco CLI

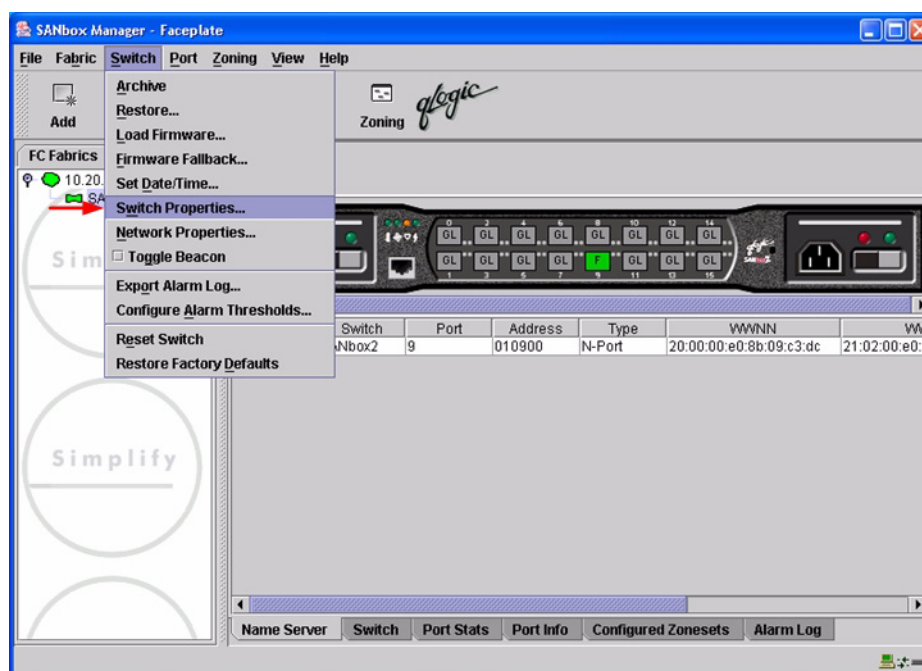
Not applicable.

QLogic SANbox Manager GUI

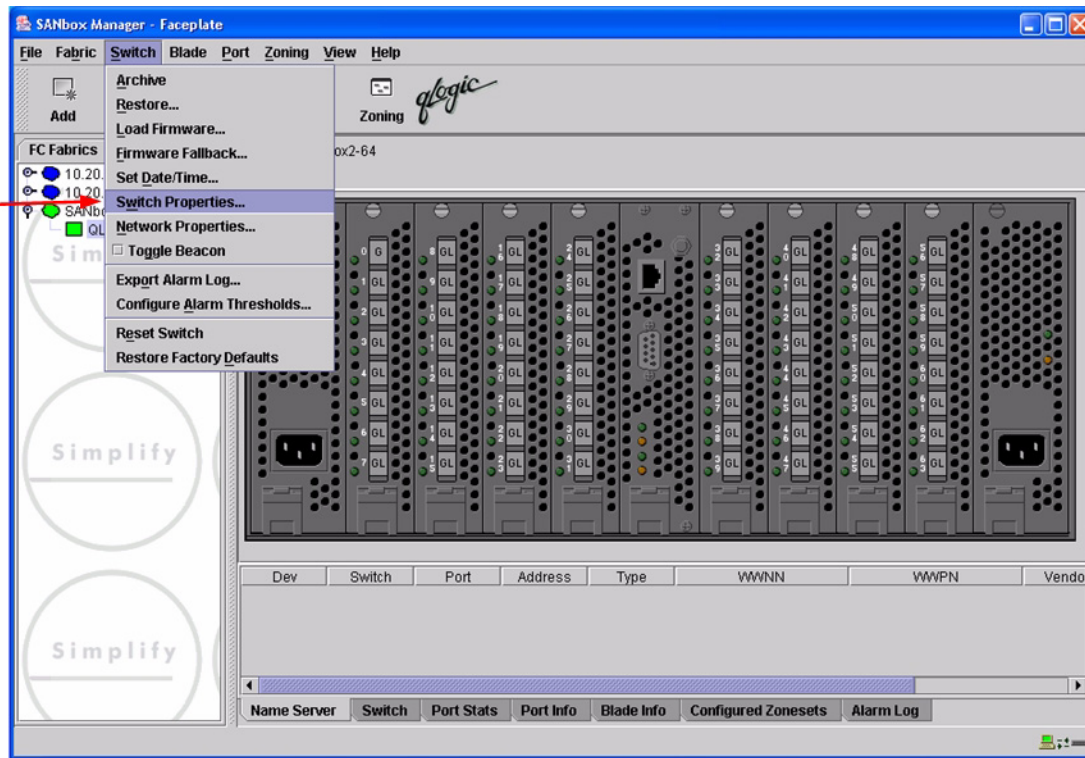
ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

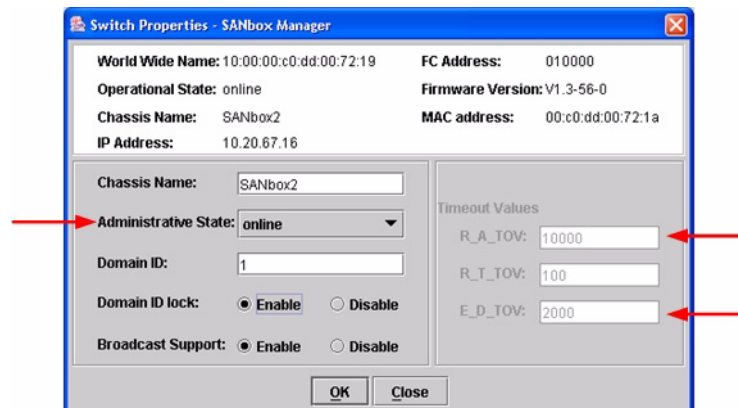


For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb	FC Address: 780000
Operational State: online	Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64	MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1	

Chassis Name: QLogic SANbox2-64

Administrative State: **online**

Domain ID: 120

Domain ID lock: ☒ Enable ☐ Disable

Broadcast Support: ☒ Enable ☐ Disable

In-band Management: ☒ Enable ☐ Disable

Timeout Values

R_A_TOV: 10000

R_T_TOV: 100

E_D_TOV: 2000

OK Close

4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

Cisco switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

NOTE: Zone and Zone Set names cannot be set using the Cisco SN 5428 Management Interface nor the Cisco CLI. Use the QLogic SANbox Manager GUI or QLogic CLI.

Cisco SN 5428 Management Interface

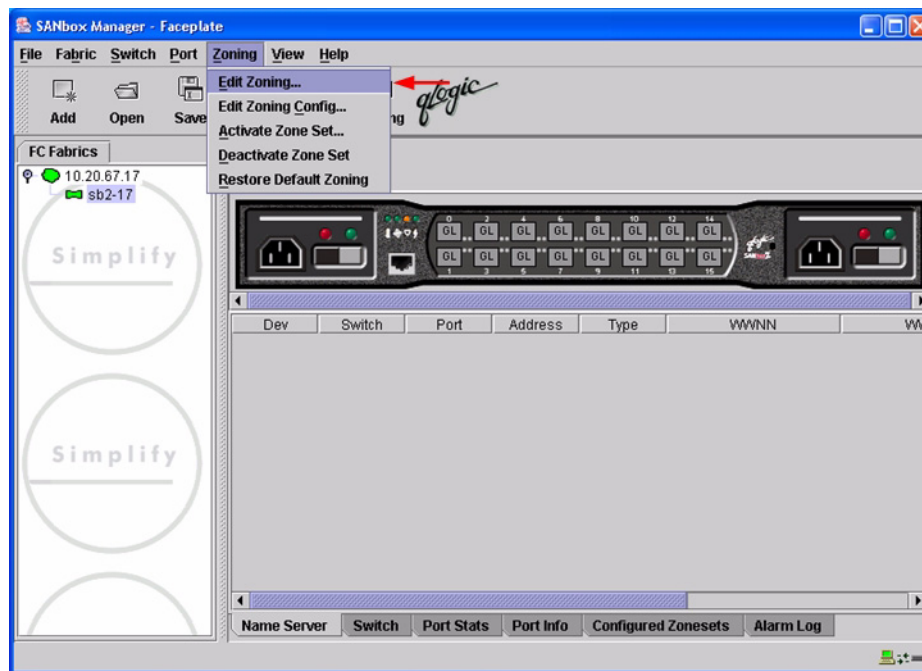
Not applicable.

Cisco CLI

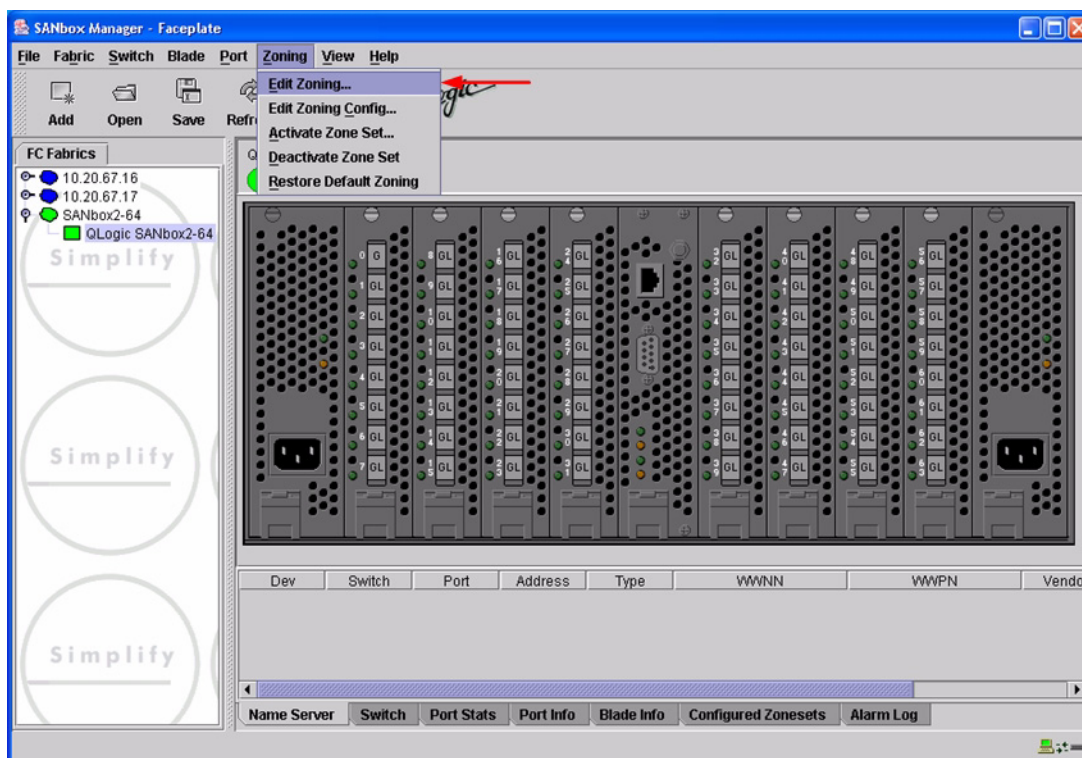
Not applicable.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

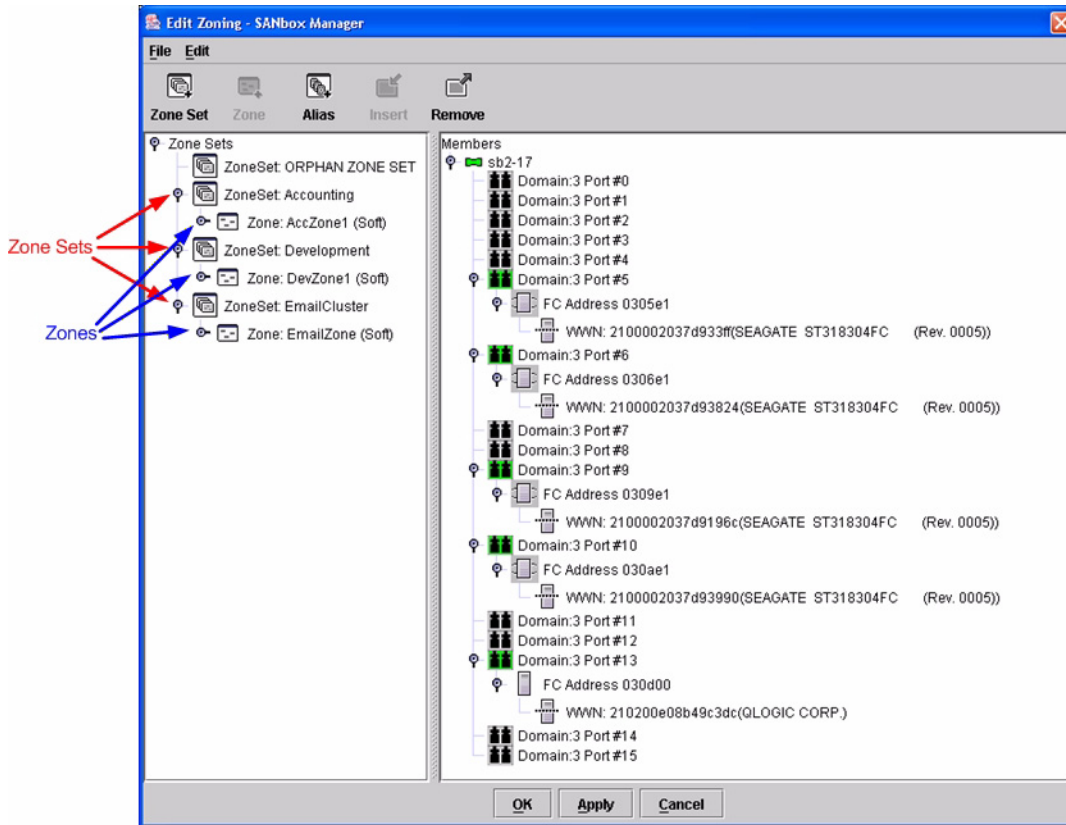


For the QLogic SANbox2-64, the following displays:

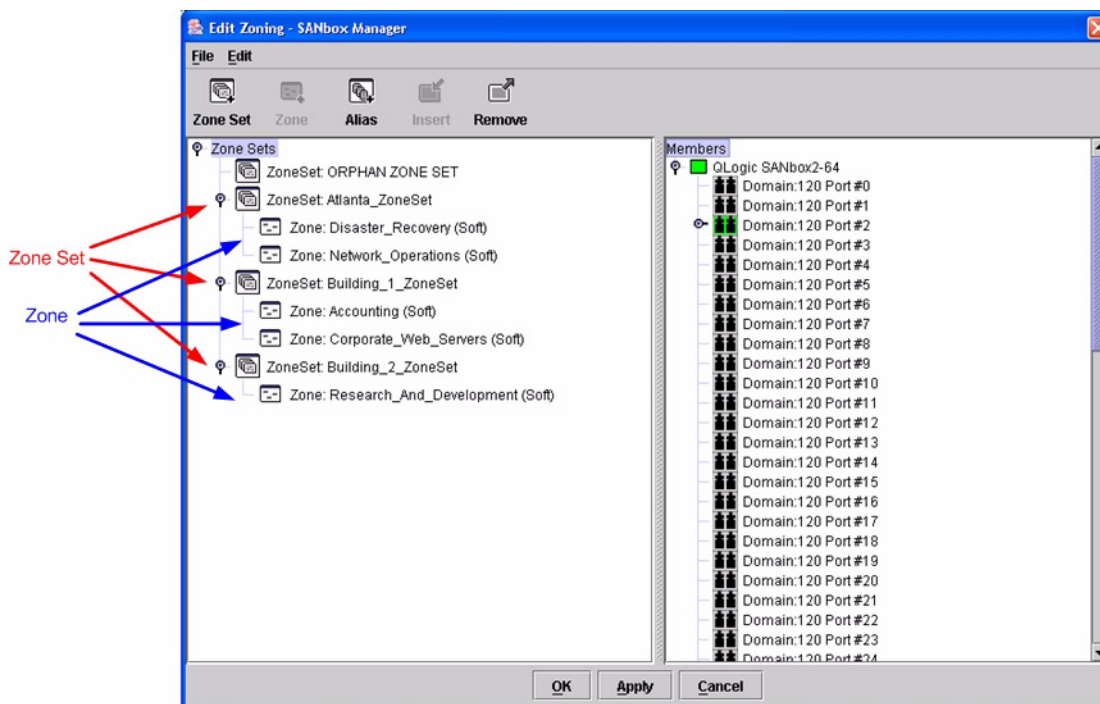


- From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 86.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

Zone Types

Not applicable.

Operating Mode Configuration

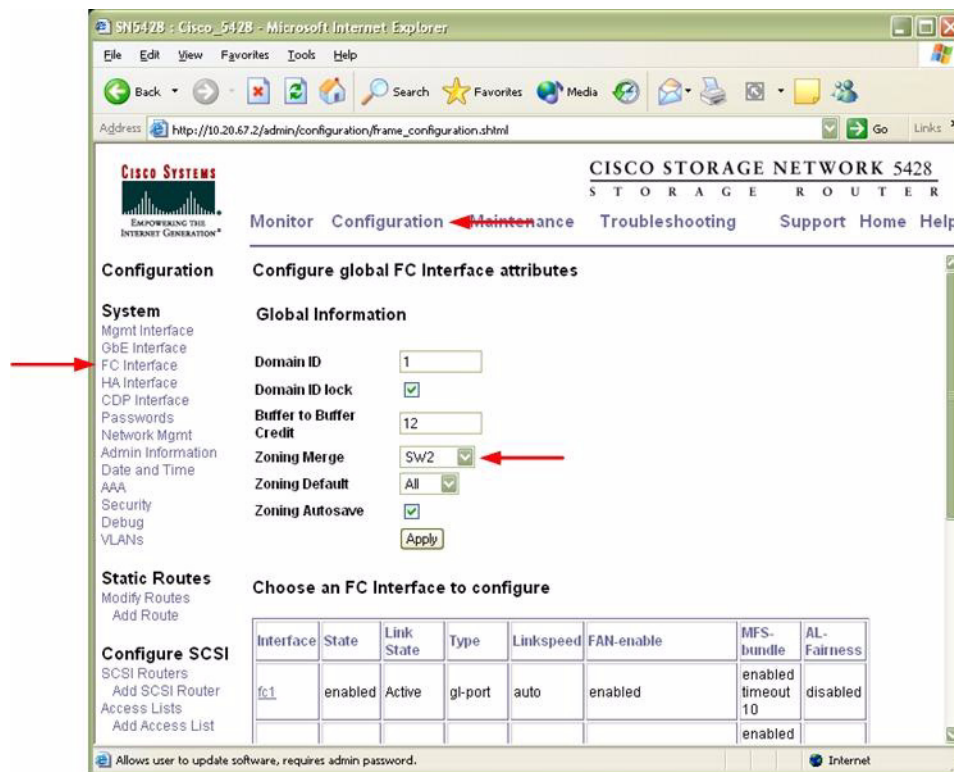
Not applicable.

Cisco Specific Configuration

Set the Zoning Merge type to SW2.

Cisco SN 5428 Management Interface

1. Start the Cisco SN 5428 Management Interface. The **Cisco Storage Network 5428 Storage Router** dialog box displays.
2. From the **Cisco Storage Network 5428 Storage Router** dialog box, do the following:
 - a. Select the primary link **Configuration**.
 - b. From the function link **System**, click **FC Interface**.
 - c. In the **Global Information Zoning Merge** box, select **SW2**.
 - d. Click **Apply**.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco SN 5428 Management Interface is not available.

ATTENTION!! This procedure requires a reboot of the switch.

```
CISCO SN 5428 Storage Router
```

```
Password: *****
```

```
[Cisco_5428]$ ena
```

```
Enter admin password: *****
```

```
[Entering Administrator mode]
```

```
[Cisco_5428]# interface fc domainid zoning merge sw2
```

```
*[Cisco_5428]# save all bootconfig
```

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the Cisco and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

Cisco MDS 9000 Series Switches

Integration Checklist

The following steps must be completed to successfully merge Cisco and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch ([see “Supported Switches and Firmware Versions” on page 94](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range ([see “Domain ID Configuration” on page 94](#)).
 - ✓ Set all switches to the appropriate timeout values ([see “Timeout Values” on page 100](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards ([see “Active Zone Set Names” on page 107](#)).
 - ✓ Ensure that all zone members are specified by WWPN ([see “Zone Types” on page 113](#)).
 - ✓ Verify that the fabrics have successfully merged ([see “Successful Integration Checklist” on page 118](#)).

Configuration Limitations

No limitations exist when merging Cisco and QLogic fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from Cisco that comply with the FC-SW-2 standard.

QLogic and Cisco Supported Switch and Firmware Versions

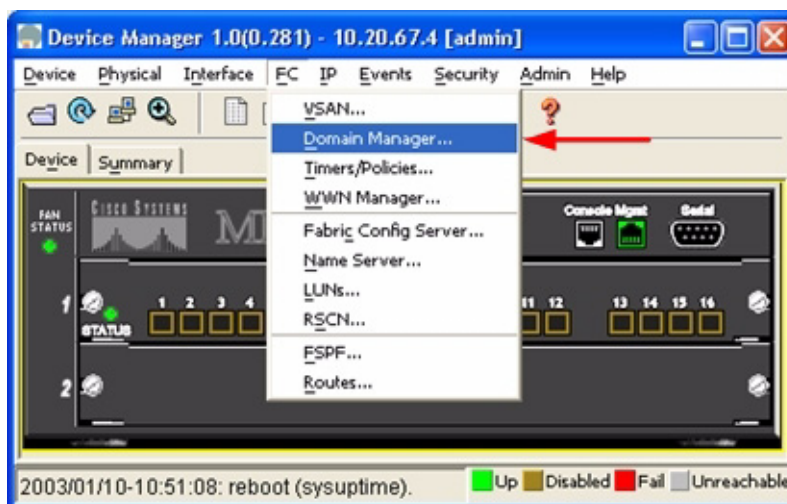
Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
Cisco	MDS 9216 Switch	1.0(1) [build 1.0(0.281)]
	MDS 9509 Director	1.0(1) [build 1.0(0.281)]

Domain ID Configuration

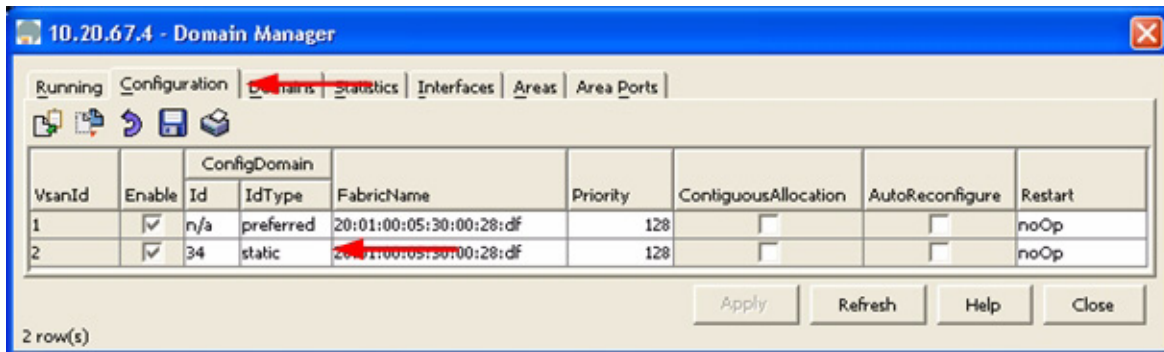
To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Cisco switch and the QLogic switch.

Cisco Device Manager

1. Start Cisco Device Manager. The **Device Manager** dialog box displays.
2. From the **Device Manager** dialog box **FC** menu, select **Domain Manager**.



3. From the **Domain Manager** dialog box, select the **Configuration** tab. For the VSAN to which you will connect the E-port, do the following:
 - a. In the **Domain ID** field, type or edit the Domain ID as appropriate.
 - b. Set the **ConfigDomain IdType** field to **Static**.
 - c. Click **Apply**.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco Device Manager is not available.

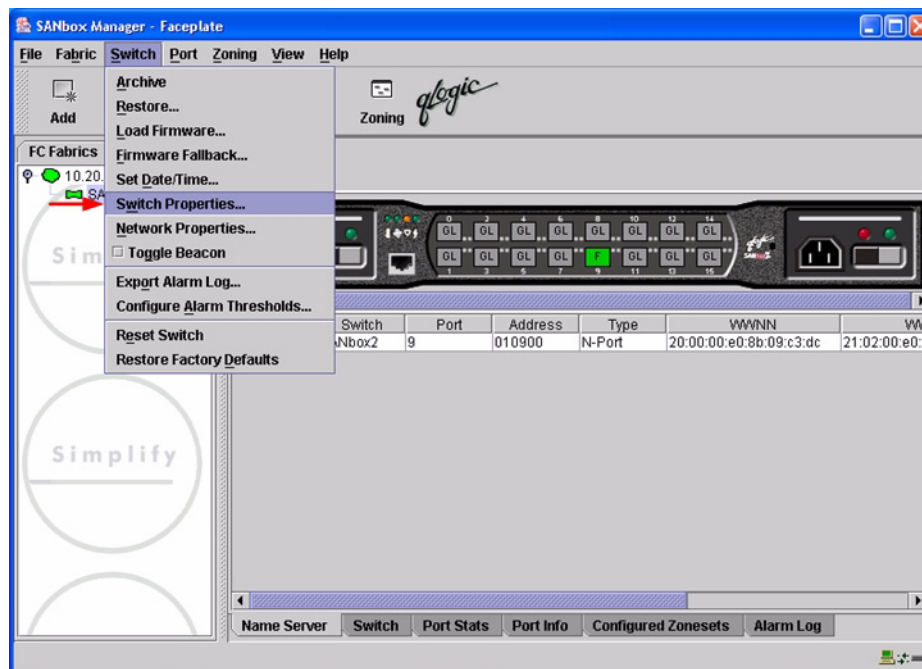
```
login: admin
Password: *****
Cisco_9216# config t
Cisco_9216(config)# fcdomain domain <domain id> static vsan <vsan id>
Cisco_9216(config)# fcdomain restart disruptive vsan <vsan id>
Cisco_9216(config)# end
```

If you want these changes to remain through a switch reset, enter the following command.

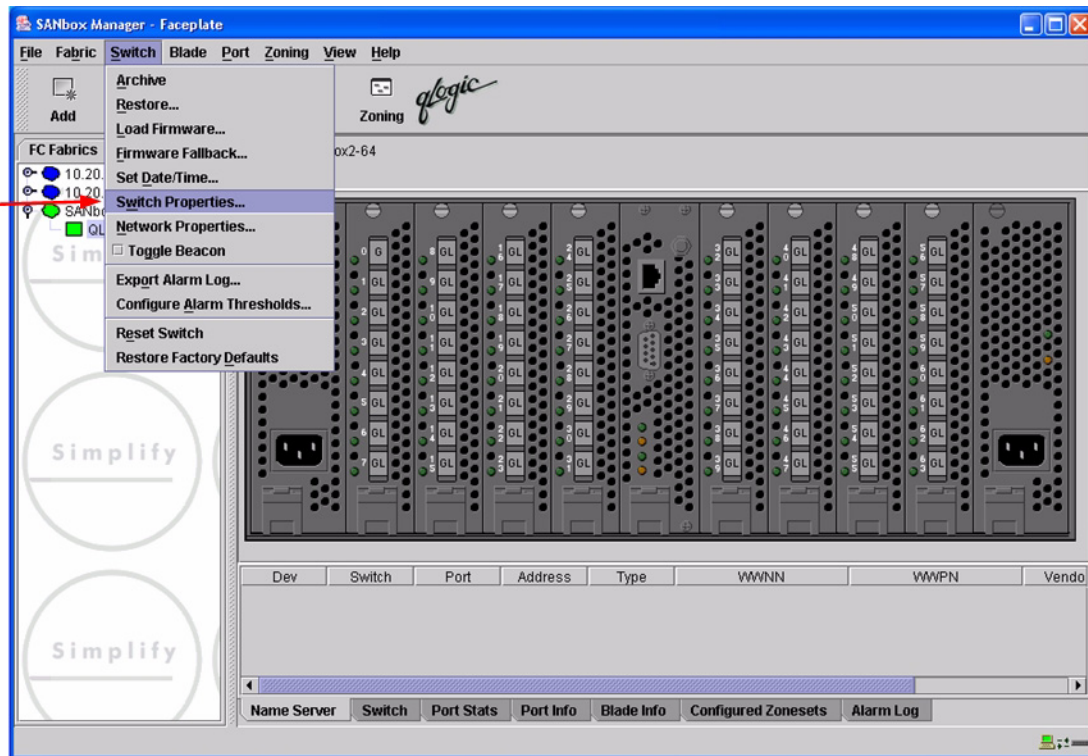
```
Cisco_9216# copy running-config startup-config
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
Operational State: online Firmware Version: V1.3-56-0
Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16

Chassis Name: SANbox2
Administrative State: online
Domain ID: 1
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
Operational State: online Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1

Chassis Name: QLogic SANbox2-64
Administrative State: online
Domain ID: 120
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable
In-band Management: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **admin start**

SANbox2 (admin) #> **config edit**

SANbox2 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1] **<choose a unique number>**

DomainIDLock (True / False) [False] **True**

SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [10000]

E_D_TOV (decimal value, 10-20000 msec) [2000]

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> **config save**

SANbox2 (admin) #> **config activate**

The configuration will be activated. Please confirm (y/n): [n] **y**

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

R_A_TOV = 10 seconds

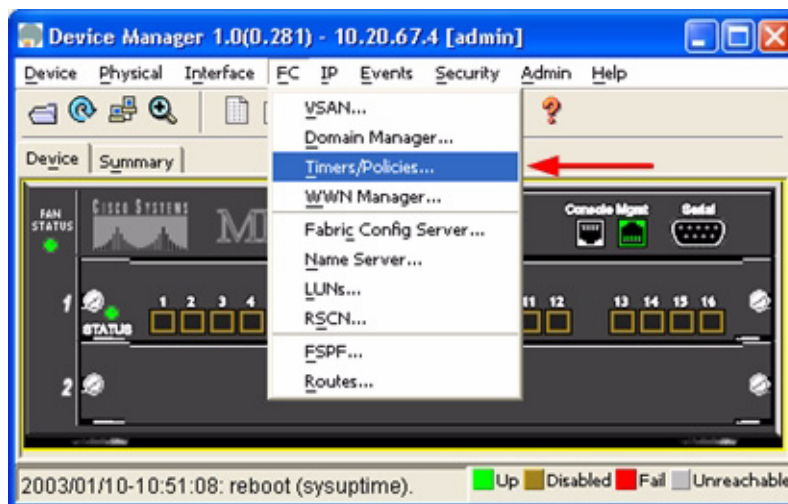
E_D_TOV = 2 seconds

This section provides the steps to change these values.

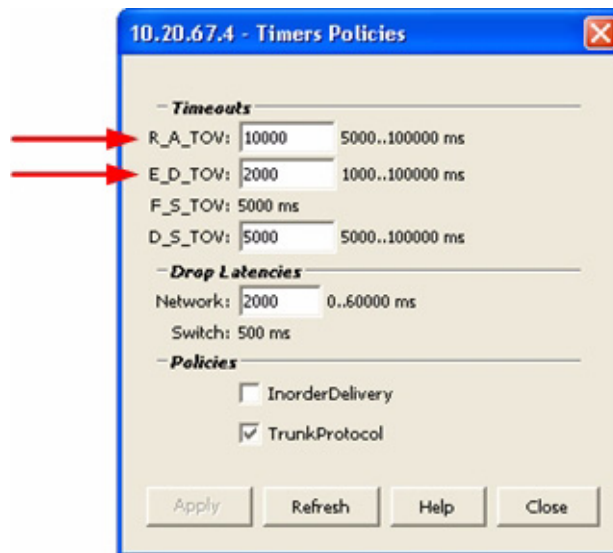
Cisco Device Manager

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start Cisco Device Manager. The **Device Manager** dialog box displays.
2. From the **Device Manager** dialog box **FC** menu, select **Timers/Policies**.



3. From the **Timers Policies** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **Apply**.



Cisco CLI

```
login: admin
```

```
Password: *****
```

```
Cisco_9216# show fctimer
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Cisco_9216# config t
```

```
Cisco_9216(config)# vsan database
```

```
Cisco_9216(config-vsan-db)# vsan <vsan id> suspend (do this for all vsan)
```

```
Cisco_9216(config-vsan-db)# exit
```

```
Cisco_9216(config)# fctimer r_a_tov 10000
```

```
Cisco_9216(config)# fctimer e_d_tov 2000
```

```
Cisco_9216(config)# vsan database
```

```
Cisco_9216(config-vsan-db)# no vsan <vsan id> suspend (do this for all vsan)
```

```
Cisco_9216(config-vsan-db)# exit
```

```
Cisco_9216(config)# end
```

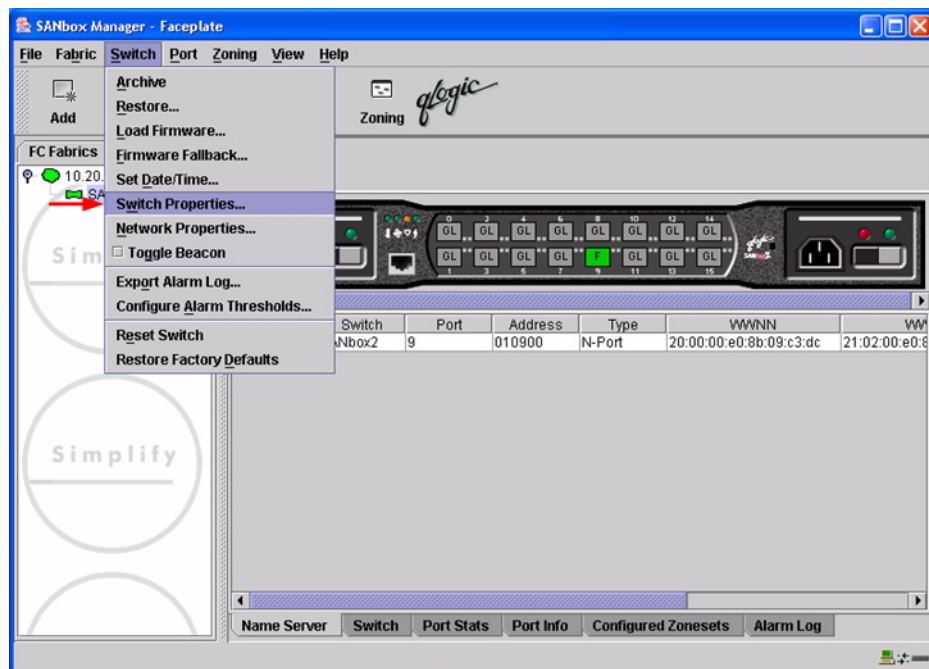
If you want these changes to remain through a switch reset, enter the following command.

```
Cisco_9216# copy running-config startup-config
```

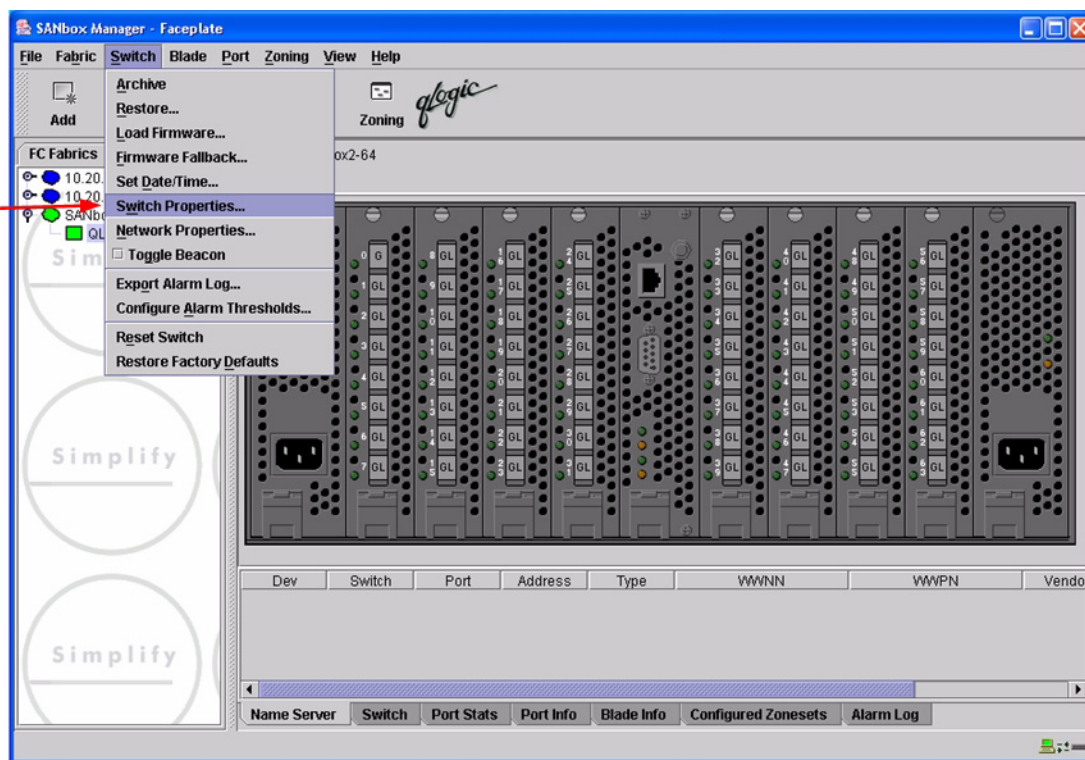
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

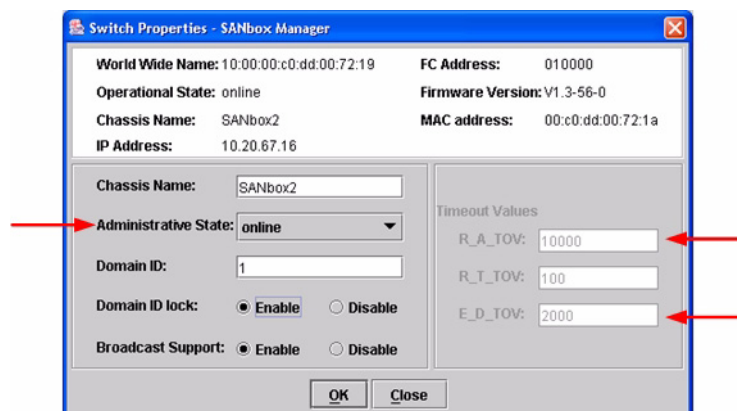


For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb	FC Address: 780000
Operational State: online	Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64	MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1	

Chassis Name: QLogic SANbox2-64

Administrative State: online

Domain ID: 120

Domain ID lock: ☒ Enable ☐ Disable

Broadcast Support: ☒ Enable ☐ Disable

In-band Management: ☒ Enable ☐ Disable

Timeout Values

R_A_TOV: 10000

R_T_TOV: 100

E_D_TOV: 2000

OK Close

4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

Cisco switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

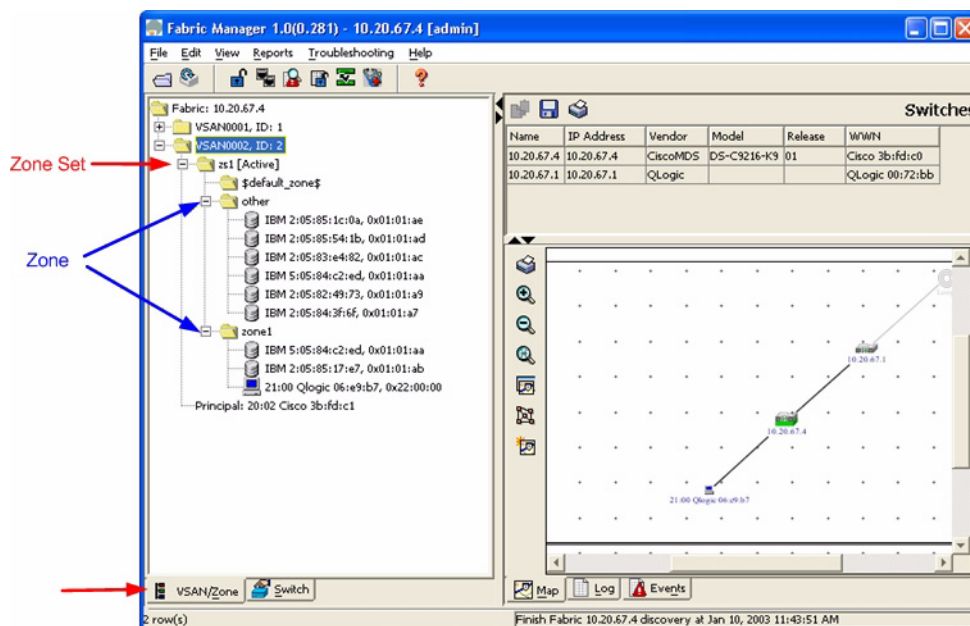
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

Cisco Fabric Manager

1. Start Cisco Fabric Manager. The **Fabric Manager** dialog box displays.
2. From the **Fabric Manager** dialog box left panel, do the following:
 - a. Select the **VSAN/Zone** tab.
 - b. Expand the VSAN to which you plan to connect the E-port.
 - c. Verify that the Zone Set names and Zone names conform to the standards discussed under [“Active Zone Set Names” on page 107](#) and are unique between the switches.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco Fabric Manager is not available.

login: **admin**

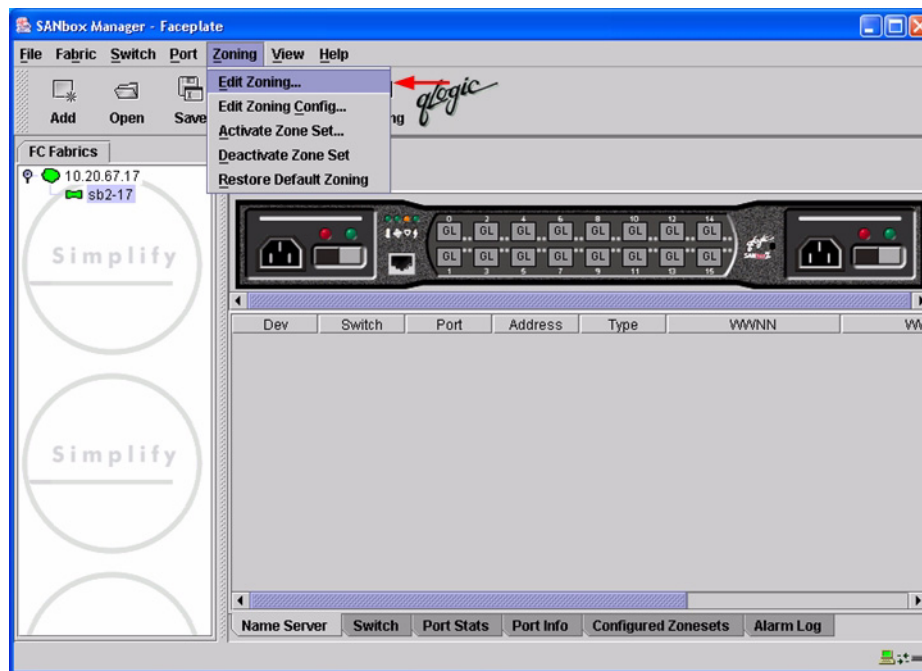
Password: *********

Cisco_9216# **show zoneset vsan <vsan id>**

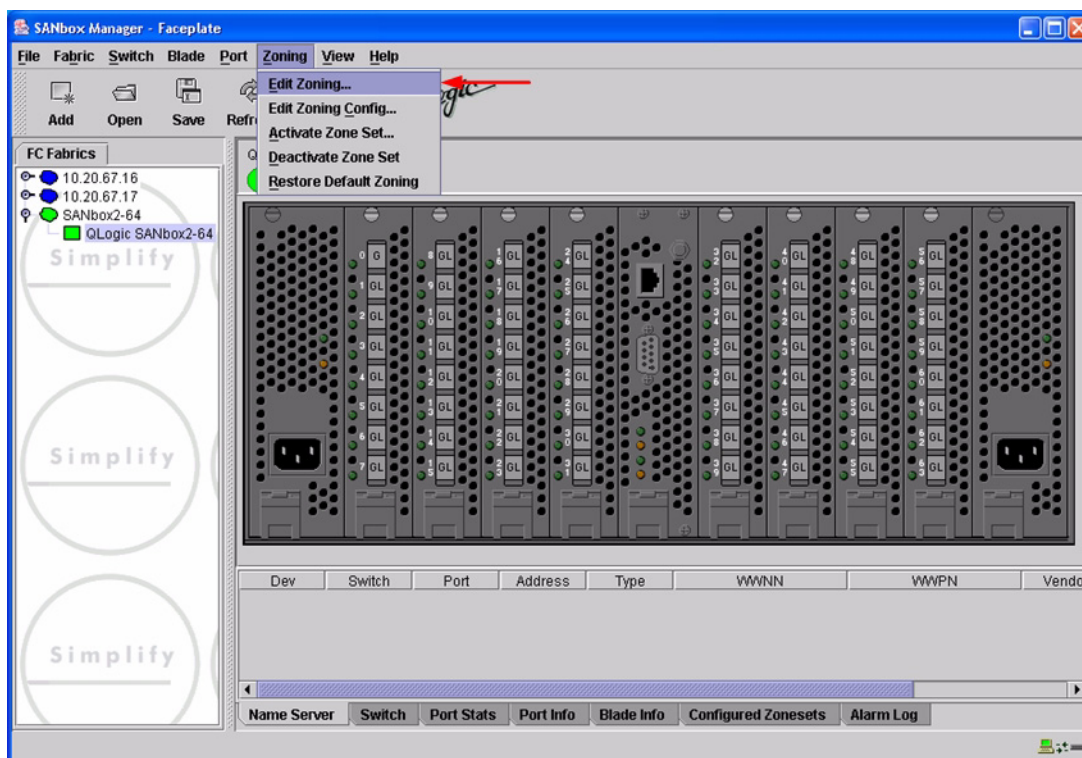
Use the above command to verify that all Zone and Zone Set names in the VSAN conform to FC standards.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

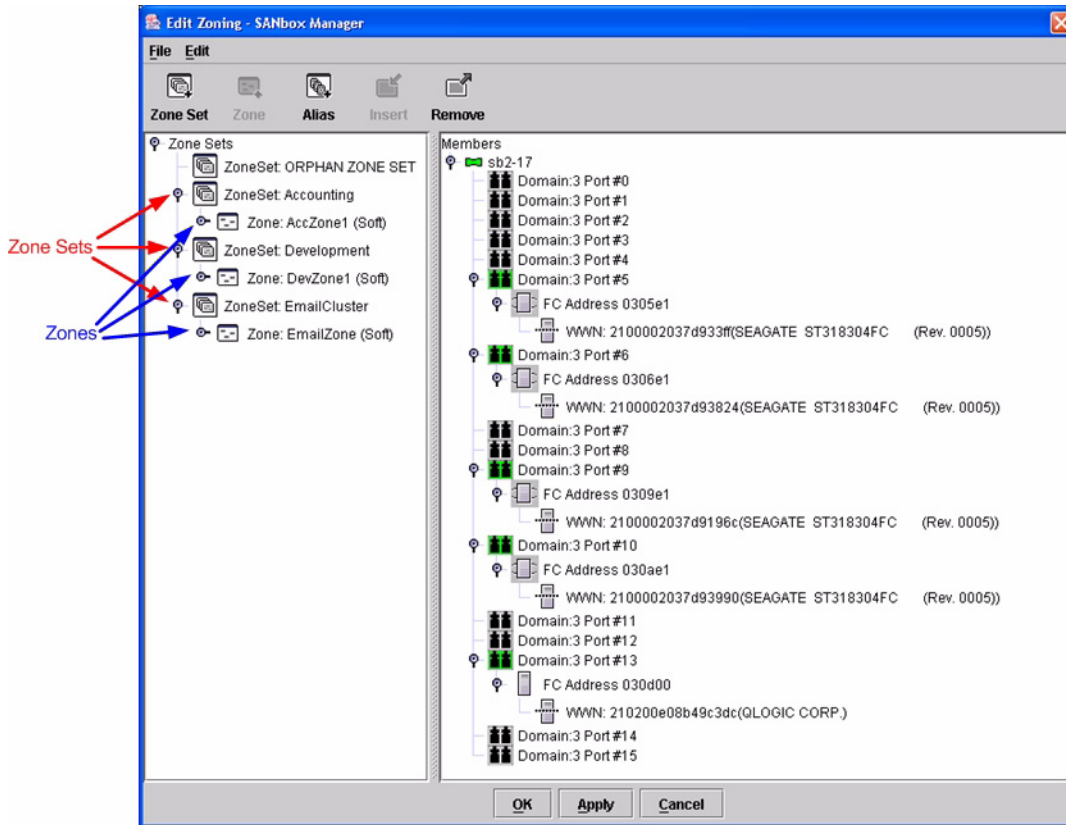


For the QLogic SANbox2-64, the following displays:

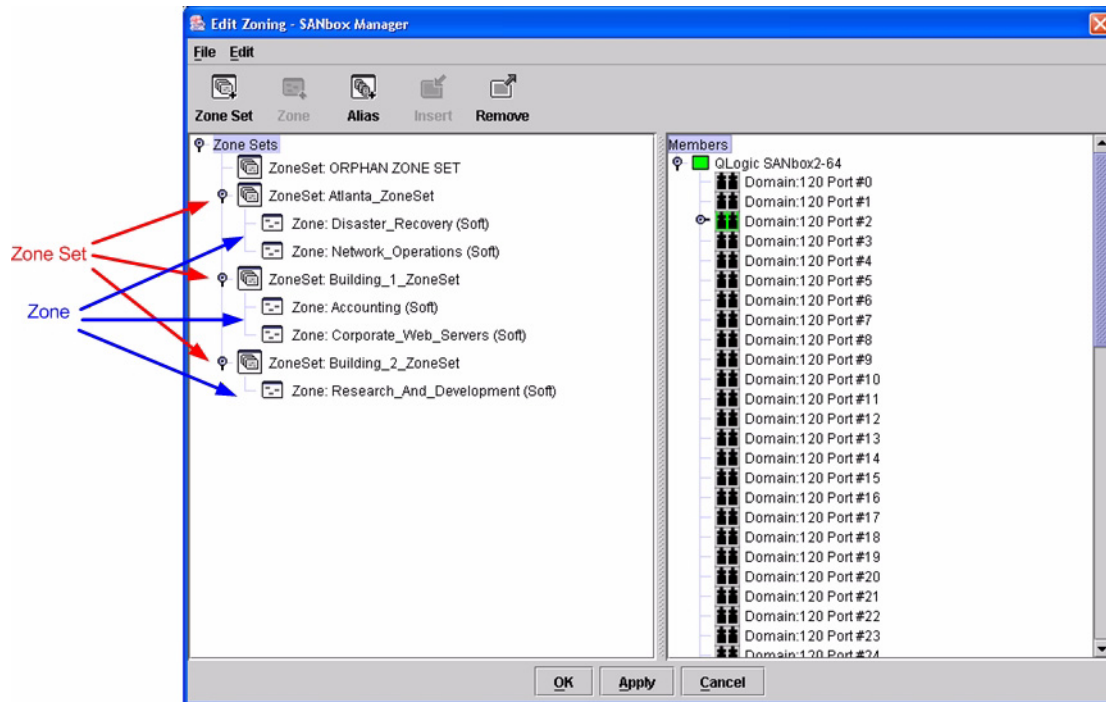


- From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 107.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

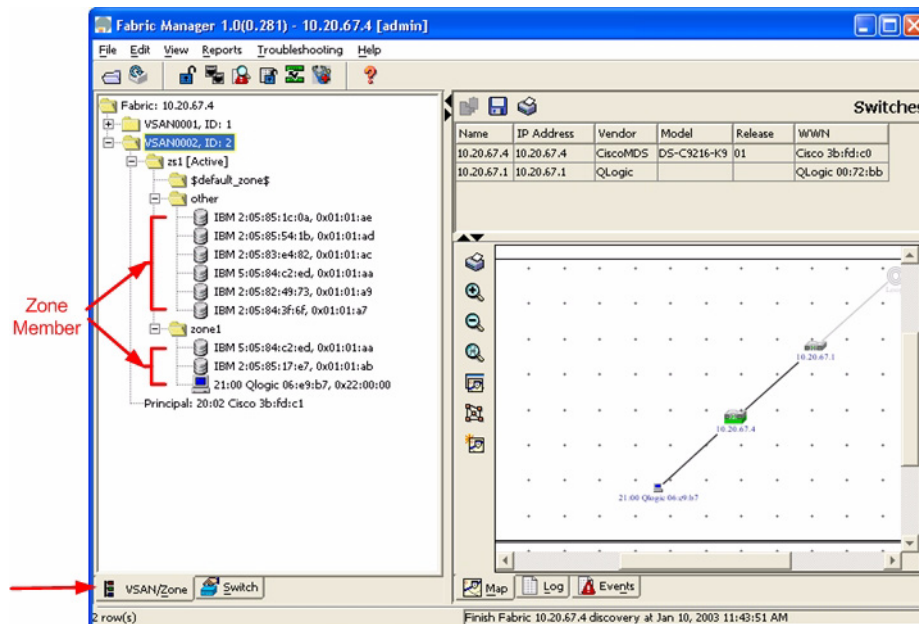
Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. For Cisco, references to pwwn refer to the WWPN. For QLogic, references to WWN refer to the WWPN.

Cisco Fabric Manager

1. Start Cisco Fabric Manager. The **Fabric Manager** dialog box displays.
2. From the **Fabric Manager** dialog box left panel, do the following:
 - a. Select the **VSAN/Zone** tab.
 - b. Expand the VSAN to which you plan to connect the E-port.
 - c. Verify that the zone member names conform to the standards discussed under [“Active Zone Set Names” on page 107](#) and are unique between the switches.



Cisco CLI

NOTE: Use the following CLI commands when the Cisco Fabric Manager is not available.

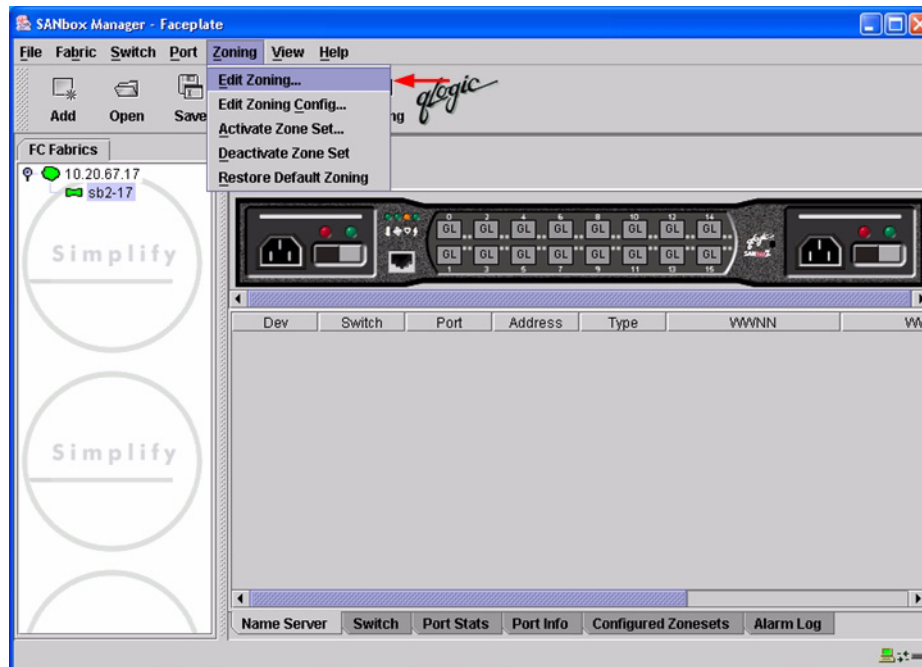
```
login: admin
Password: *****
Cisco_9216# show zone vsan <vsan id>
```

Use the above command to verify that all zone members are specified by pwwn.

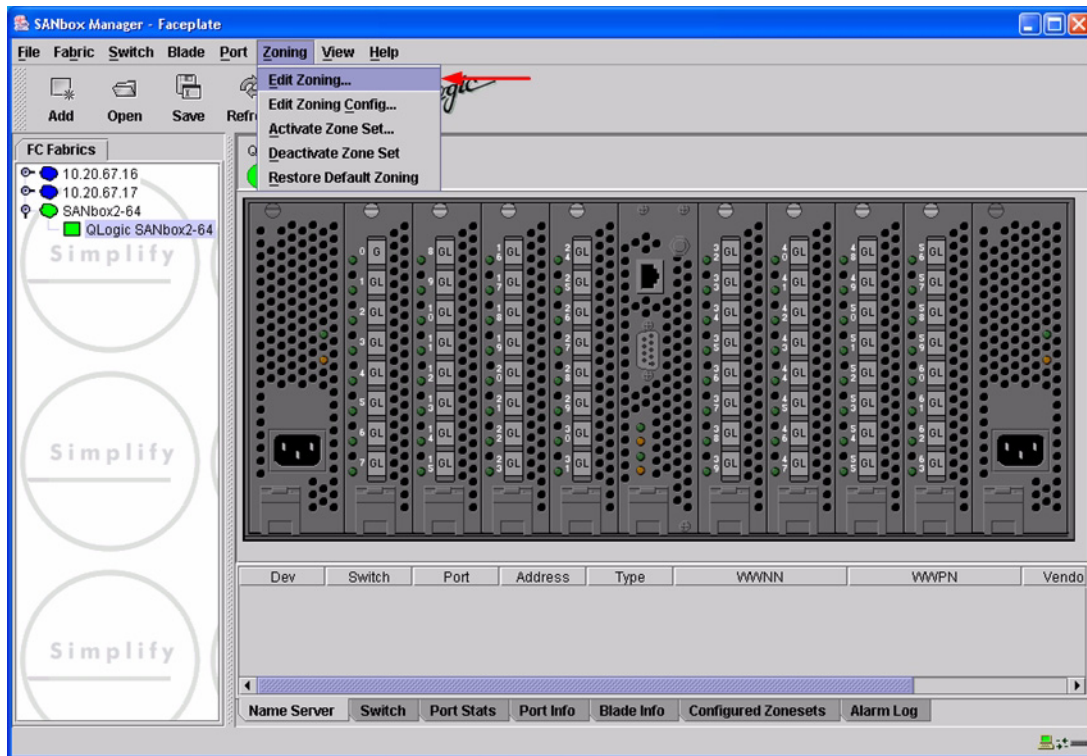
QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

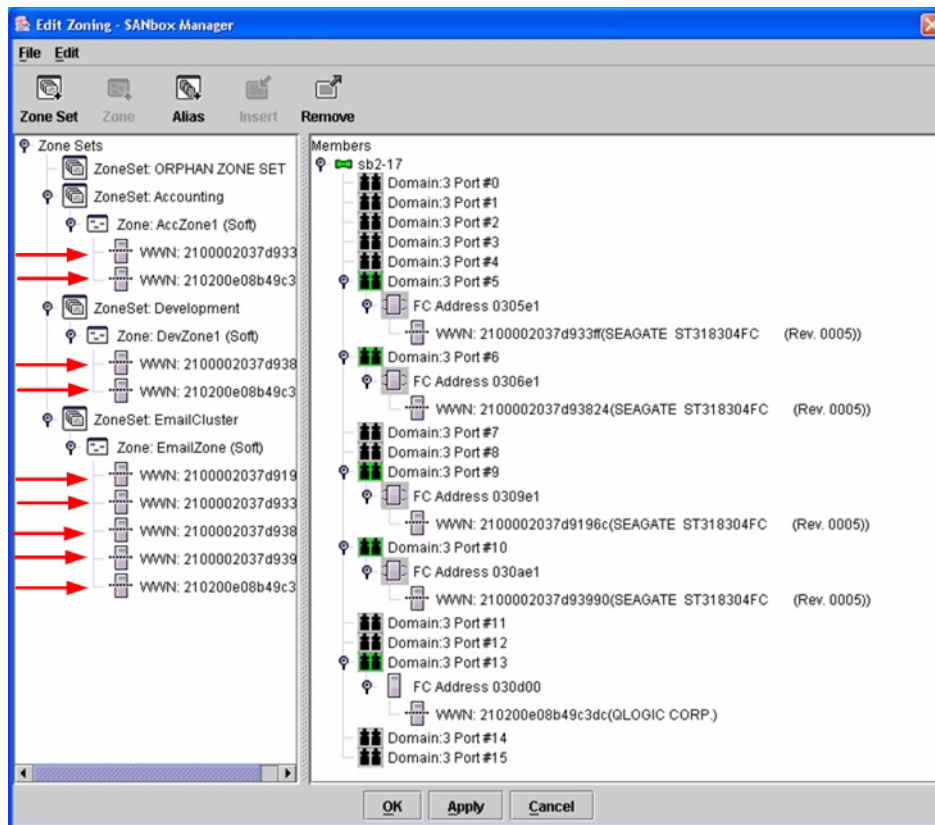


For the QLogic SANbox2-64, the following displays:

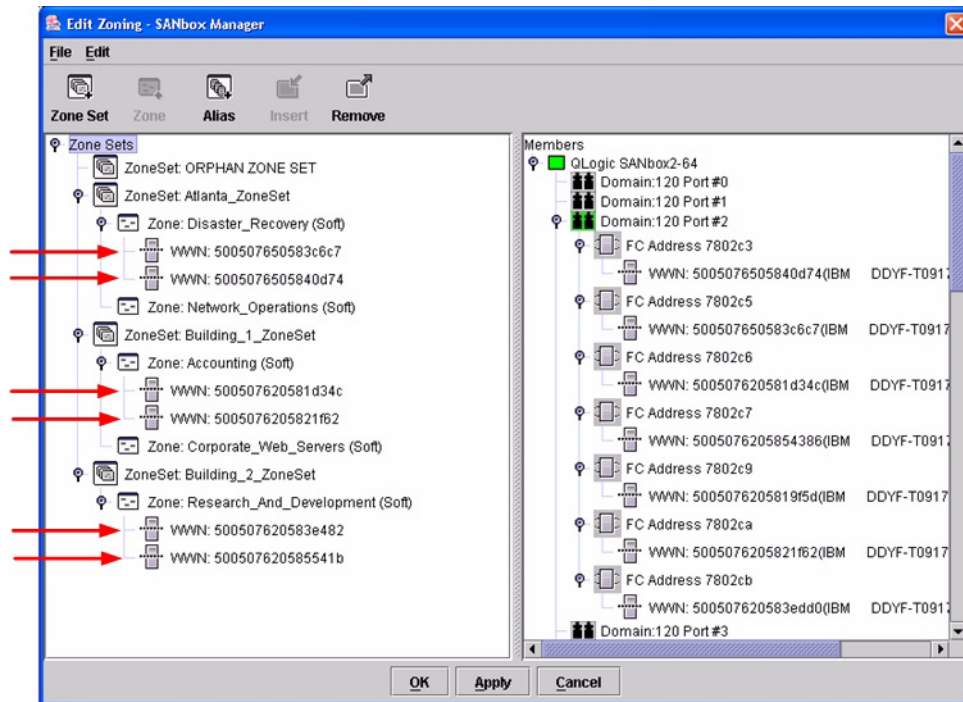


3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2#> **zone list <zone name>**

Confirm that only WWNs are listed.

Operating Mode Configuration

Not applicable.

Cisco Specific Configuration

Not applicable.

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the Cisco and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

Merging QLogic and IBM BladeCenter Fabrics

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following IBM eServer BladeCenter Fibre Channel Switch Module that complies with the FC-SW-2 standard.

QLogic and IBM Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8	1.3.x and above
	SANbox2-16	1.3.x and above
	SANbox2-64	1.5.x and above
IBM	IBM eServer BladeCenter Fibre Channel Switch Module	1.4.0.35.00 or above

IBM eServer BladeCenter Fibre Channel Switch Module ([see page 121](#)) provides detailed information about merging QLogic and IBM BladeCenter fabrics.

IBM eServer BladeCenter Fibre Channel Switch Module

Integration Checklist

The following steps must be completed to successfully merge IBM BladeCenter and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches and Firmware Versions” on page 122](#)).
 - ✓ Ensure that each switch has a unique Domain ID (see [“Domain ID Configuration” on page 123](#)).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values” on page 130](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names” on page 137](#)).
 - ✓ Ensure that all QLogic switches are configured for Merge Active Zonesets Only or SW2 mode, as appropriate (see [“Operating Mode Configuration” on page 143](#)).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist” on page 145](#)).

Configuration Limitations

No limitations exist when merging IBM BladeCenter and QLogic fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following IBM eServer BladeCenter Fibre Channel Switch Module that complies with the FC-SW-2 standard.

QLogic and IBM Supported Switch and Firmware Versions

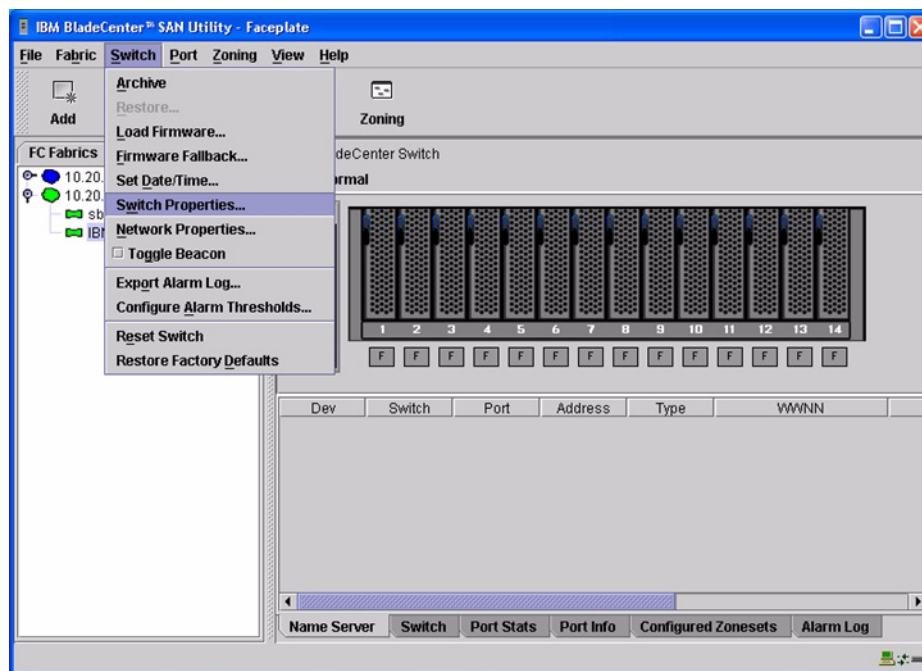
Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
IBM	IBM eServer BladeCenter Fibre Channel Switch Module	1.4.0.35.00 or above

Domain ID Configuration

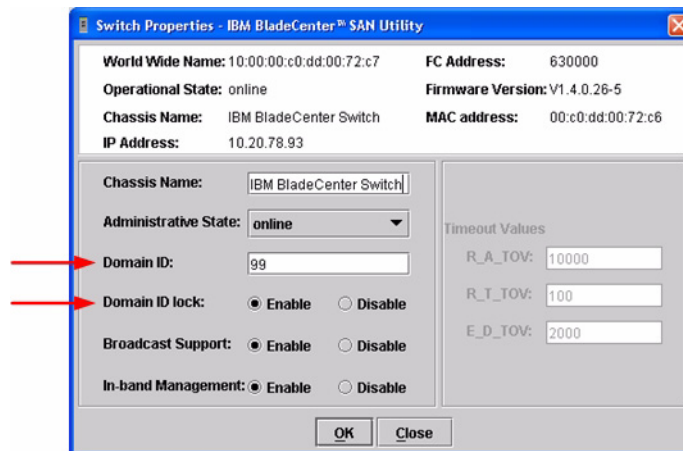
To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the QLogic switch and the IBM eServer BladeCenter Fibre Channel Switch Module.

IBM eServer BladeCenter SAN Utility

1. Start the IBM eServer BladeCenter SAN Utility. The **IBM BladeCenter SAN Utility—Faceplate** dialog box displays.
2. From the **IBM BladeCenter SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—IBM BladeCenter SAN Utility** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.



IBM eServer BladeCenter Fibre Channel Switch Module CLI

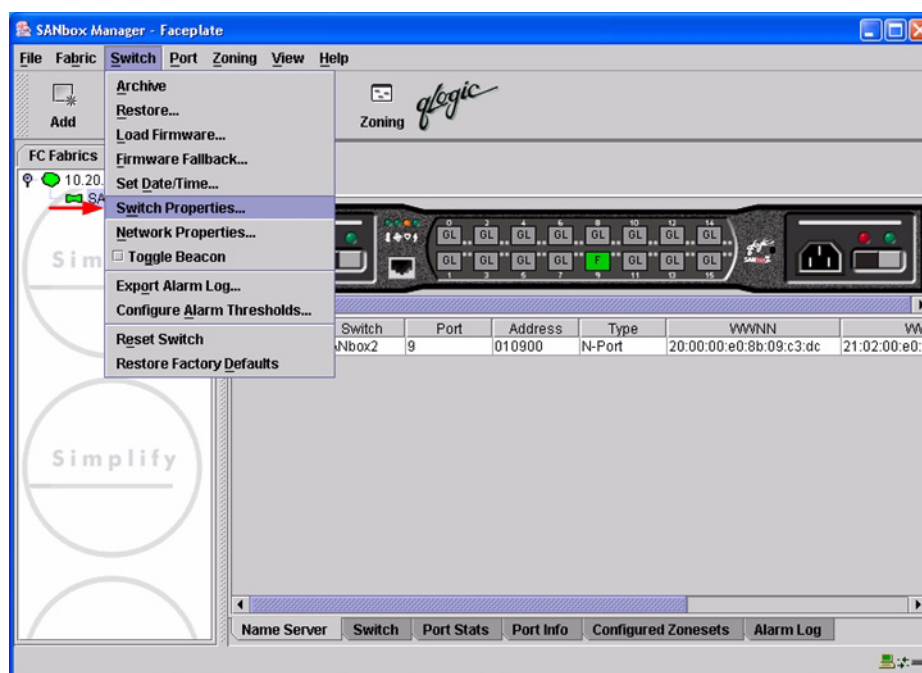
NOTE: Use the CLI commands when the IBM eServer BladeCenter SAN Utility is not available.

```
Login: admin
Password: xxxxxxxxx
IBM BladeCenter #> admin start
IBM BladeCenter (admin) #> config edit
IBM BladeCenter (admin-config) #> set config switch

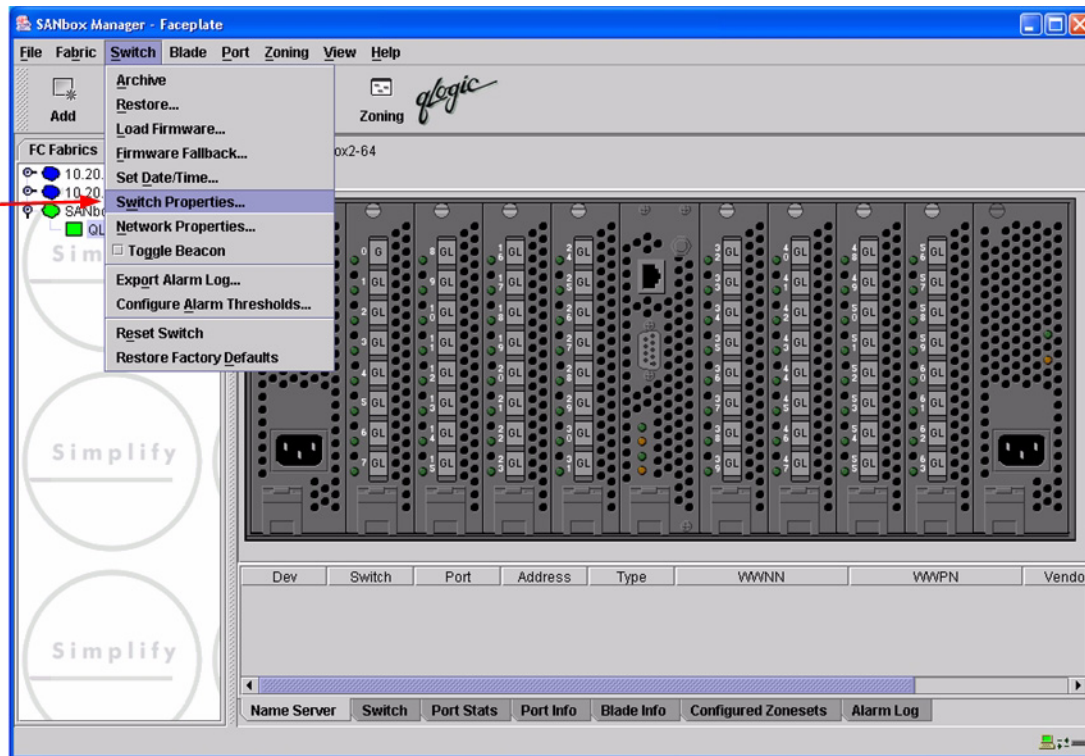
The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1] <97-127>
DomainIDLock (True / False) [False] True
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [10000]
E_D_TOV (decimal value, 10-20000 msec) [2000]
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
IBM BladeCenter (admin-config) #> config save
IBM BladeCenter (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
Operational State: online Firmware Version: V1.3-56-0
Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16

Chassis Name:

Administrative State:

Domain ID: (indicated by a red arrow)

Domain ID lock: ☒ Enable ☐ Disable (indicated by a red arrow)

Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV:
R_T_TOV:
E_D_TOV:

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
Operational State: online Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1

Chassis Name:

Administrative State:

Domain ID: (indicated by a red arrow)

Domain ID lock: ☒ Enable ☐ Disable (indicated by a red arrow)

Broadcast Support: ☒ Enable ☐ Disable

In-band Management: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV:
R_T_TOV:
E_D_TOV:

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **admin start**

SANbox2 (admin) #> **config edit**

SANbox2 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1] **<choose a unique number>**

DomainIDLock (True / False) [False] **True**

SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [10000]

E_D_TOV (decimal value, 10-20000 msec) [2000]

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> **config save**

SANbox2 (admin) #> **config activate**

The configuration will be activated. Please confirm (y/n): [n] **y**

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

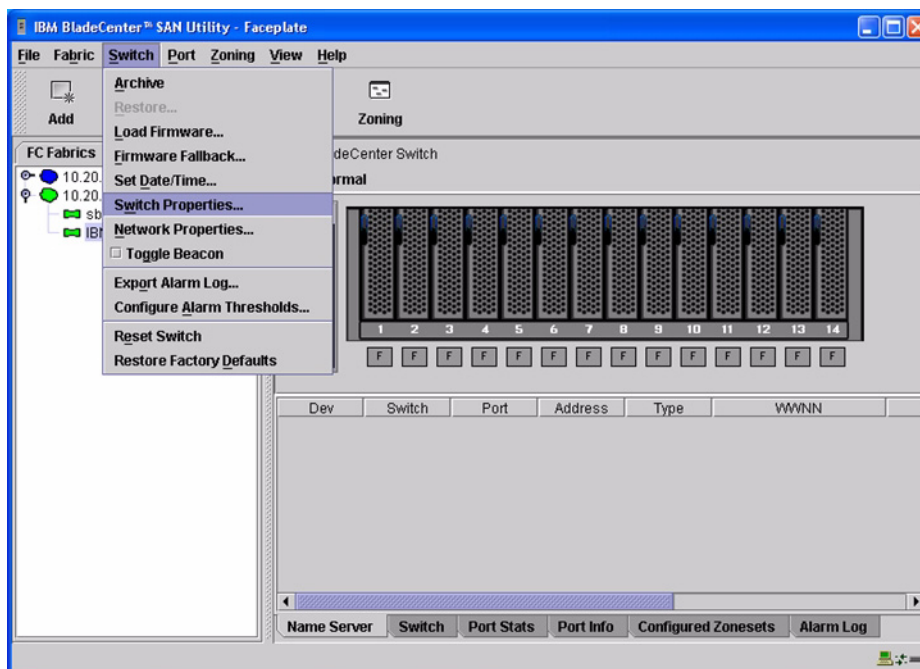
R_A_TOV = 10 seconds
E_D_TOV = 2 seconds

This section provides the steps to change these values.

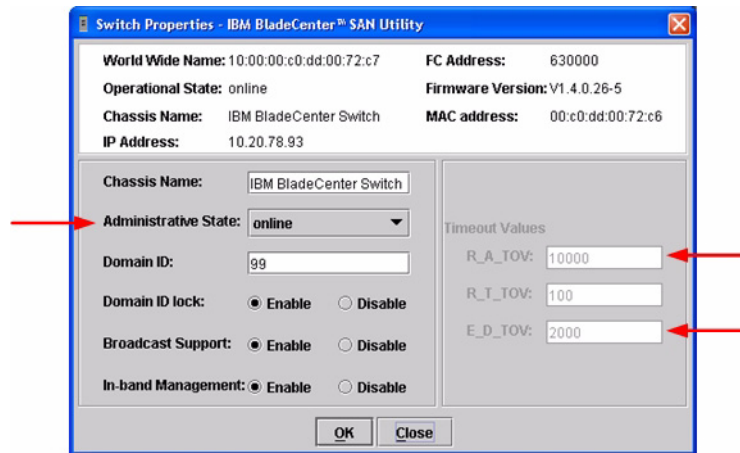
IBM eServer BladeCenter SAN Utility

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the IBM eServer BladeCenter SAN Utility. The **IBM BladeCenter SAN Utility—Faceplate** dialog box displays.
2. From the **IBM BladeCenter SAN Utility—Faceplate** dialog box **Switch** menu, select **Switch Properties**.



3. From the **Switch Properties—IBM BladeCenter SAN Utility** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



4. From the **Switch Properties—IBM BladeCenter SAN Utility** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—IBM BladeCenter SAN Utility** dialog box ([see step 2](#)). DO the following:
 - a. In the **R_A_TOV** box, enter **10000**.
 - b. In the **E_D_TOV** box, enter **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—IBM BladeCenter SAN Utility** dialog box ([see step 2](#)). In the **Administrative State** list, select **Online**. Click **OK**.

IBM eServer BladeCenter Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the IBM eServer BladeCenter SAN Utility is not available.

```
Login: admin
```

```
Password: xxxxxxxxx
```

```
IBM BladeCenter #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
IBM BladeCenter #> admin start
```

```
IBM BladeCenter (admin) #> config edit
```

```
IBM BladeCenter (admin-config) #> set config switch
```

The following options display:

```
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
```

```
BroadcastEnabled (True / False) [True]
```

```
InbandEnabled (True / False) [True]
```

```
DefaultDomainID (decimal value, 1-239) [1]
```

```
DomainIDLock (True / False) [True]
```

```
SymbolicName (string, max=32 chars) [Fibre Channel Switch Module]
```

```
R_T_TOV (decimal value, 1-1000 msec) [100]
```

```
R_A_TOV (decimal value, 100-100000 msec) [9000]     10000
```

```
E_D_TOV (decimal value, 10-20000 msec) [1000]     2000
```

```
FS_TOV (decimal value, 100-100000 msec) [5000]
```

```
DS_TOV (decimal value, 100-100000 msec) [5000]
```

```
PrincipalPriority (decimal value, 1-255) [254]
```

```
ConfigDescription (string, max=64 chars) [Default Config]
```

```
IBM BladeCenter (admin-config) #> config save
```

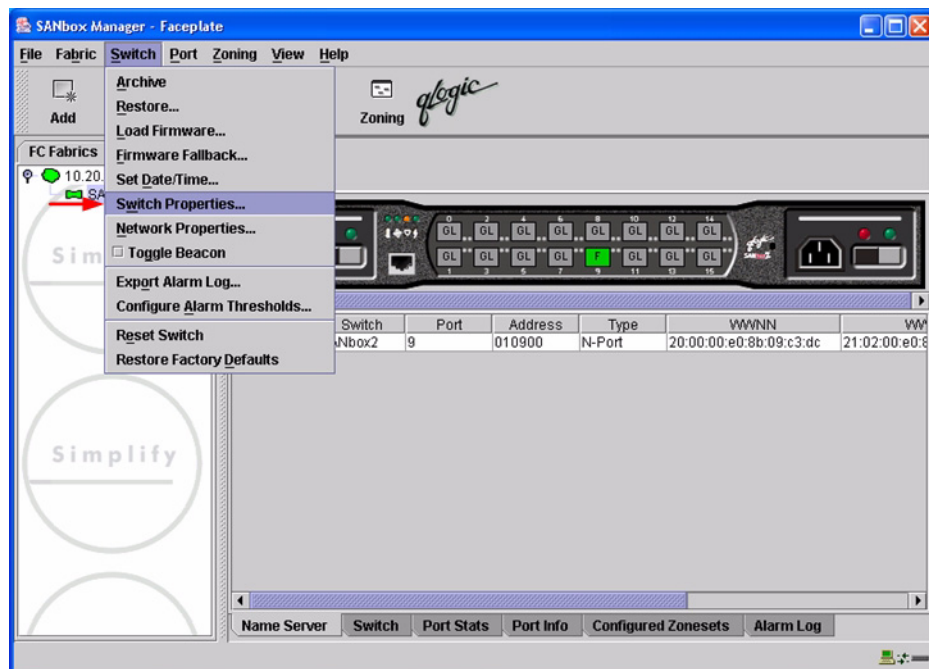
```
IBM BladeCenter (admin) #> config activate
```

```
The configuration will be activated. Please confirm (y/n): [n] y
```

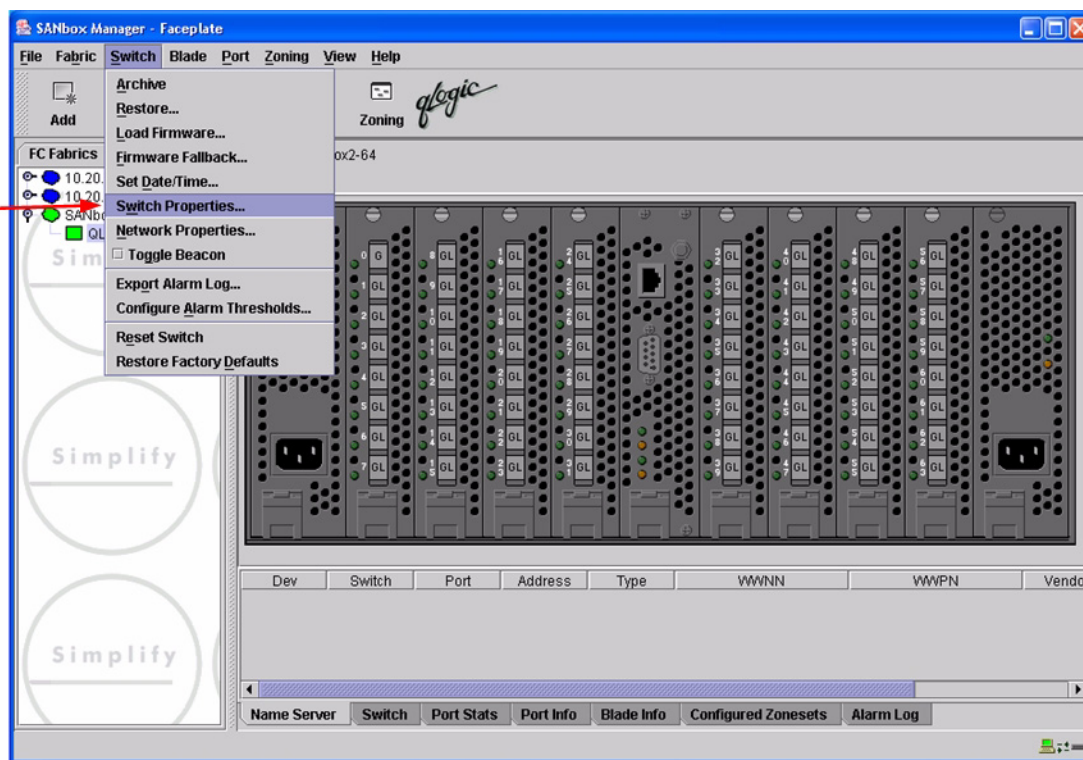
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

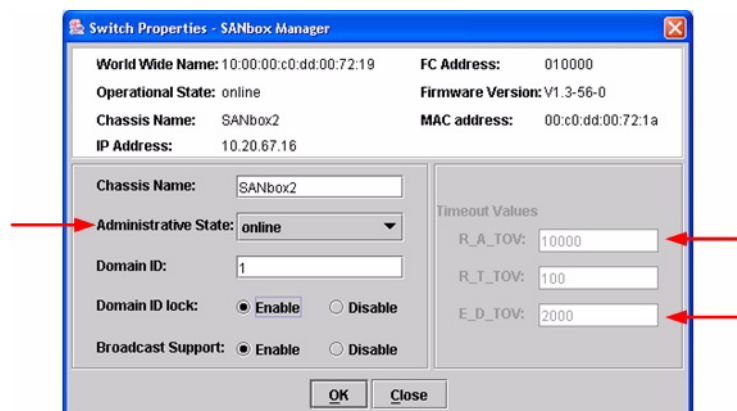


For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb	FC Address: 780000
Operational State: online	Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64	MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1	

Chassis Name: QLogic SANbox2-64

Administrative State: **online**

Domain ID: 120

Domain ID lock: ☒ Enable ☐ Disable

Broadcast Support: ☒ Enable ☐ Disable

In-band Management: ☒ Enable ☐ Disable

Timeout Values

R_A_TOV: 10000

R_T_TOV: 100

E_D_TOV: 2000

OK Close

4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

IBM eServer BladeCenter Fibre Channel Switch Modules and QLogic SANblade switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

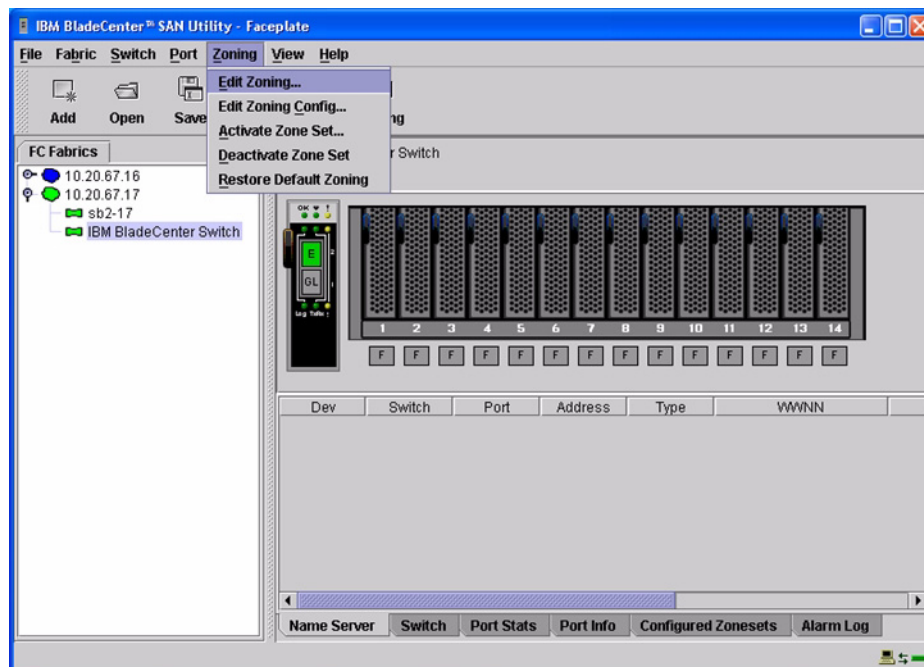
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

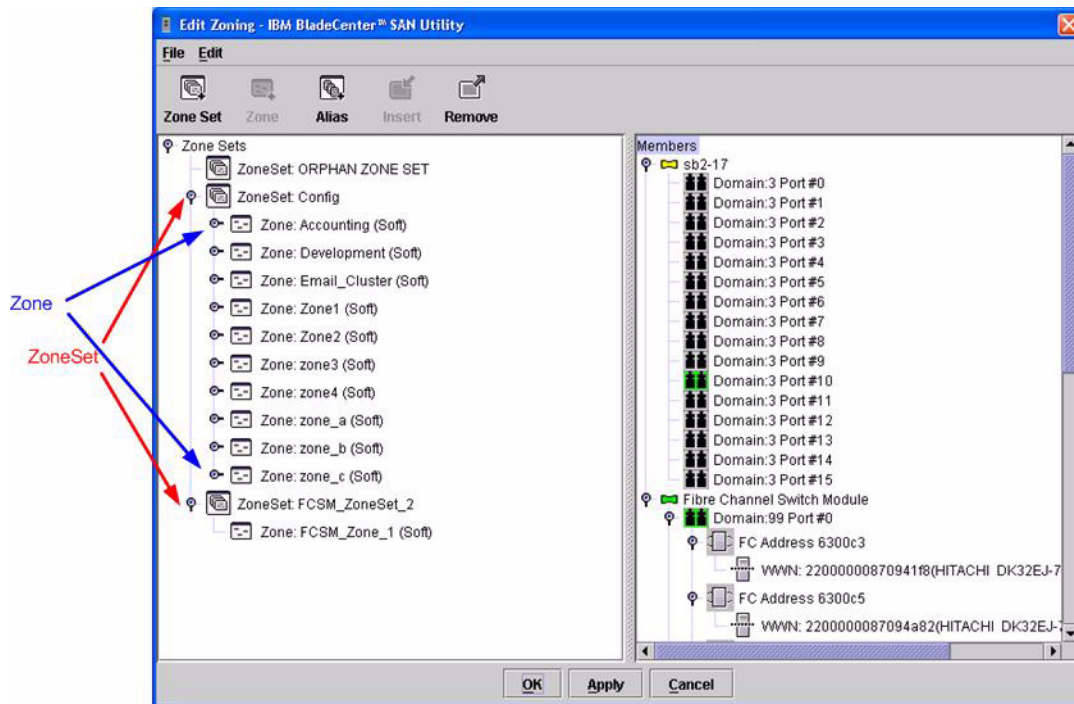
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

IBM eServer BladeCenter SAN Utility

1. Start the IBM eServer BladeCenter SAN Utility. The **IBM BladeCenter SAN Utility—Faceplate** dialog box displays.
2. From the **IBM BladeCenter SAN Utility—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.



3. From the **Edit Zoning—IBM BladeCenter SAN Utility** dialog box, compare the Zone Set and Zone names from each switch to ensure that none have the same name and the names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 137.



IBM eServer BladeCenter Fibre Channel Switch Module CLI

NOTE: Use the CLI commands when the IBM eServer BladeCenter SAN Utility is not available.

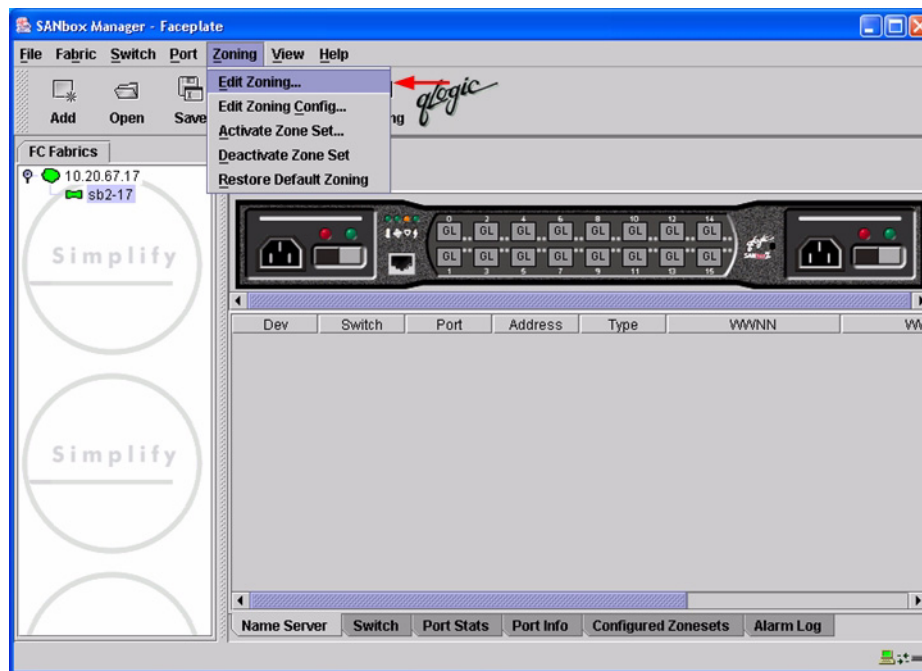
Login: **admin**

Password: **xxxxxxxx**

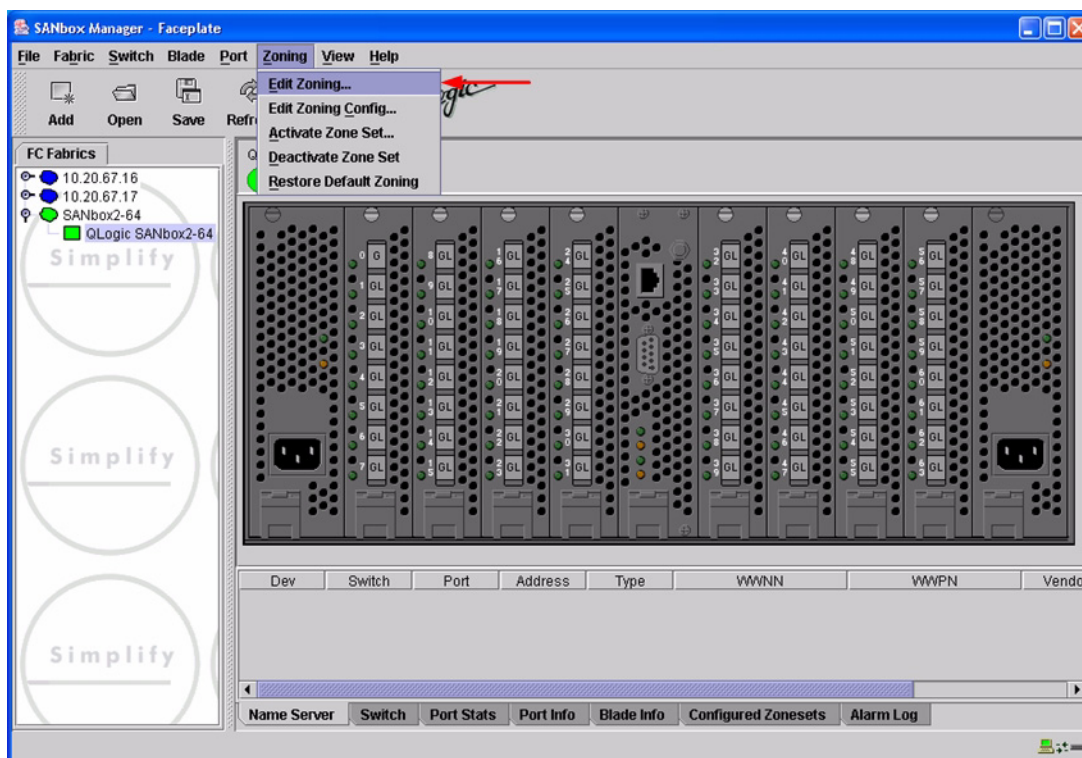
IBM BladeCenter #> **zone list**

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

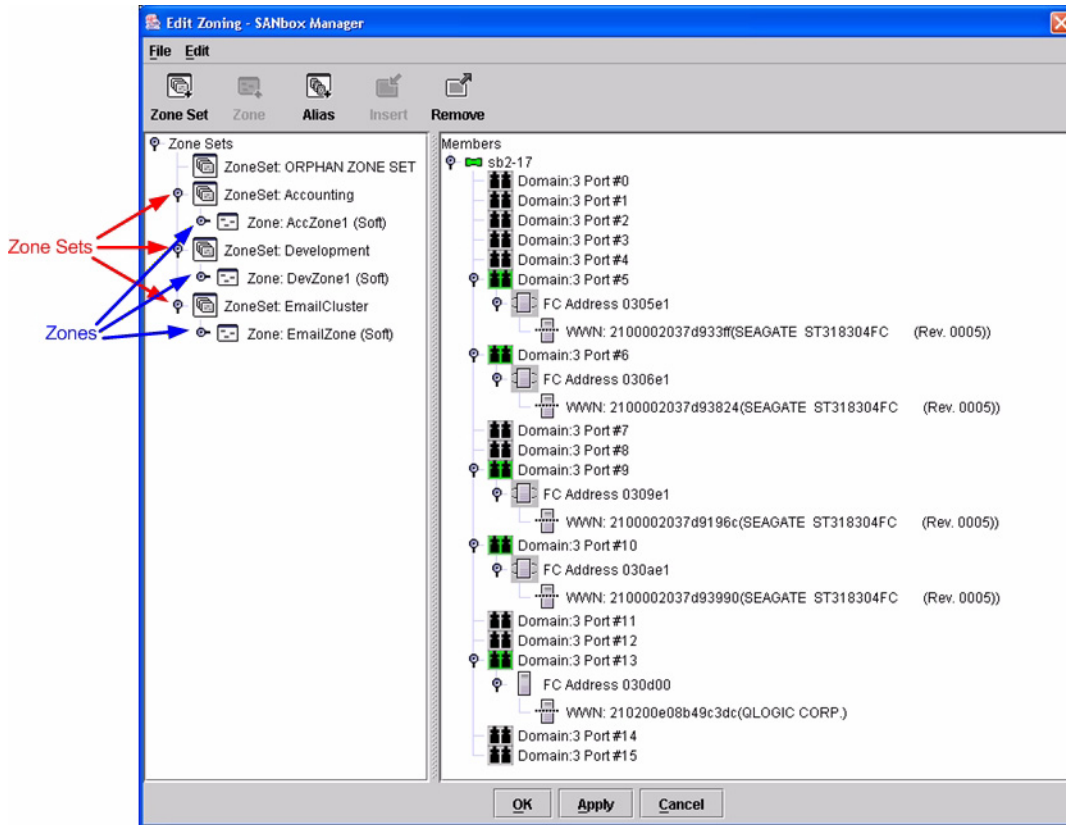


For the QLogic SANbox2-64, the following displays:

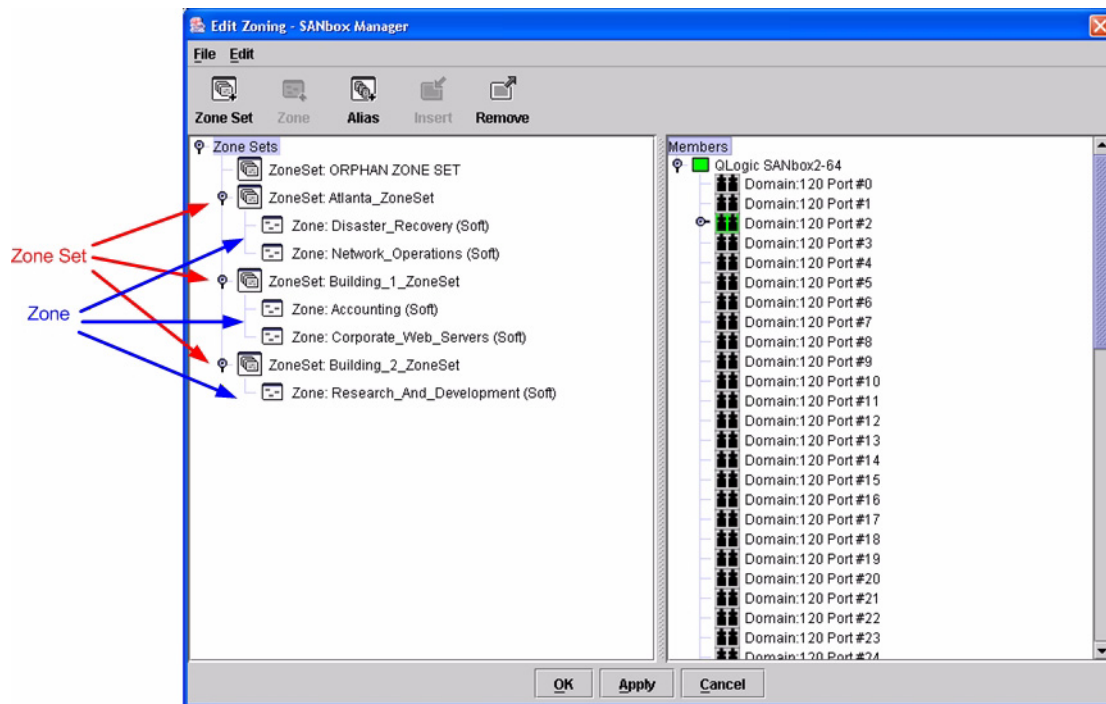


- From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 137.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

Zone Types

This configuration supports all IBM eServer BladeCenter Fibre Channel Switch Module and QLogic SANbox2 Zone types.

Operating Mode Configuration

NOTE: Perform the following steps only when connecting from a QLogic SANbox2-8 or SANbox2-16 with version 1.3.xxx firmware.

IBM eServer BladeCenter SAN Utility

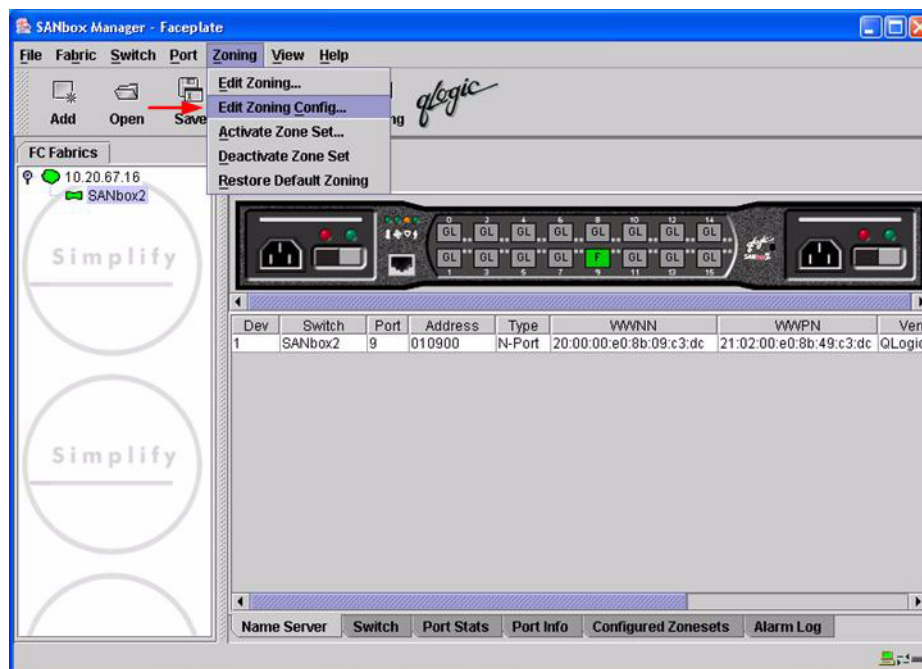
Not applicable.

IBM eServer BladeCenter Fibre Channel Switch Module CLI

Not applicable.

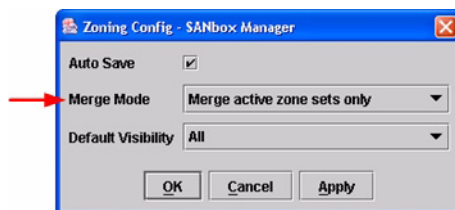
QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning Config**.



3. The **Zoning Config—SANbox Manager** dialog box displays.

In the **Merge Mode** list, select **Merge Active Zonesets Only**. This is equivalent to SW2 mode in the CLI.



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config zoning
    The following options display:
    AutoSave      (True / False)  [True]
    Default       (All / None)    [All ]
    MergeMode     (Brocade / SW2) [SW2 ]
SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

IBM BladeCenter Specific Configuration

Not applicable.

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the IBM BladeCenter and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, contact QLogic support.

Merging QLogic and INRANGE Fabrics

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switch from INRANGE that complies with the FC-SW-2 standard.

QLogic and INRANGE Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
INRANGE	FC/9000 Switch	Code set 3.0.3.2 or above

INRANGE FC/9000 Switch ([see page 149](#)) provides detailed information about merging QLogic and INRANGE fabrics.

INRANGE FC/9000 Switch

Integration Checklist

The following steps must be completed to successfully merge INRANGE and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches and Firmware Versions” on page 150](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration” on page 150](#)).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values” on page 155](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names” on page 161](#)).
 - ✓ Ensure that the zone member type is set to Port WWN (see [“Zone Types” on page 171](#)).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist” on page 179](#)).

Configuration Limitations

When merging INRANGE and QLogic fabrics, the maximum number of switches that can be configured depends upon the INRANGE switch configuration.

- For the FC/9000-64, the maximum is 56 interconnected switches per fabric.
- For the FC/9000-128, the maximum is 48 interconnected switches per fabric.

Otherwise, all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switch from INRANGE that complies with the FC-SW-2 standard.

QLogic and INRANGE Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
INRANGE	FC/9000 Switch	Code set 3.0.3.2 or above

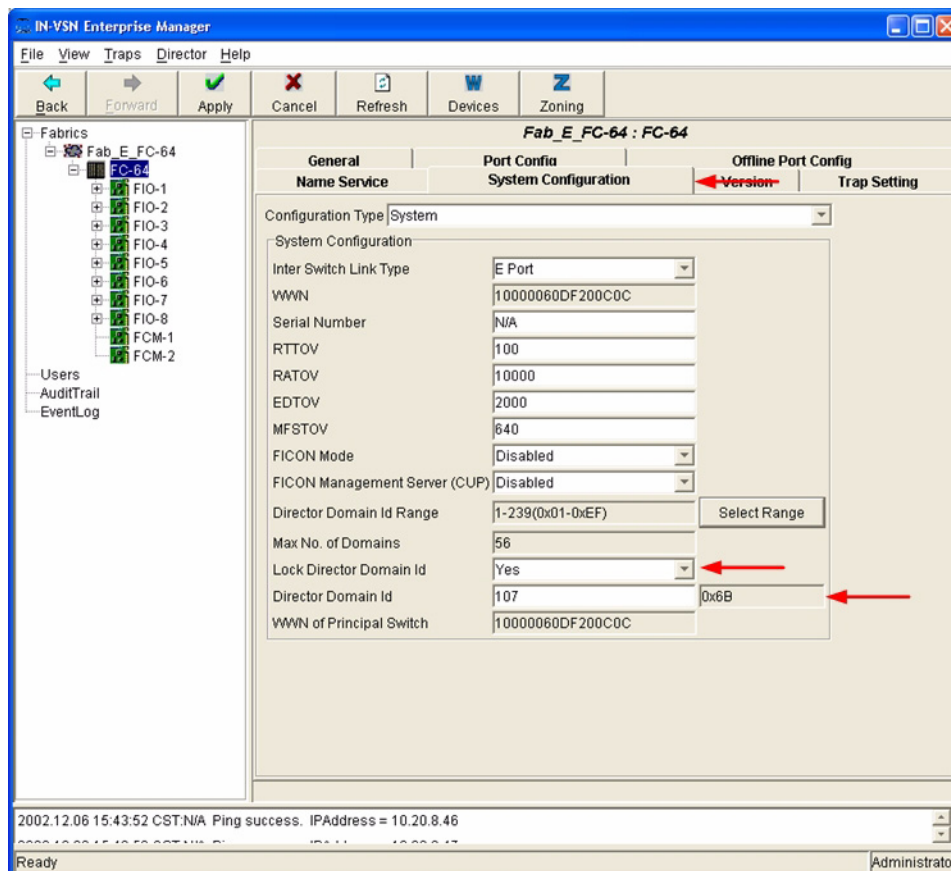
Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the INRANGE switch and the QLogic Switch.

NOTE: The Domain ID should be locked and unique within the 1–239 range.

INRANGE IN-VSN Enterprise Manager

1. Start the INRANGE IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays.
2. From the **IN-VNS Enterprise Manager** dialog box, select the **System Configuration** tab and do the following:
 - a. In the **Director Domain ID** box, type a unique Domain ID.
 - b. In the **Lock Director Domain ID** list, select **Yes**.
 - c. Click **Apply**.

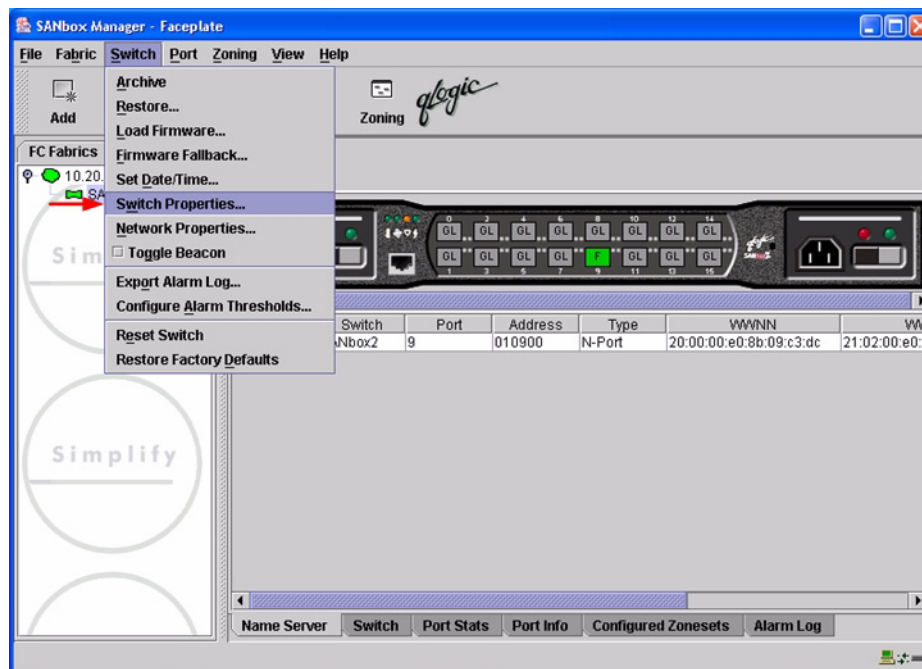


INRANGE CLI

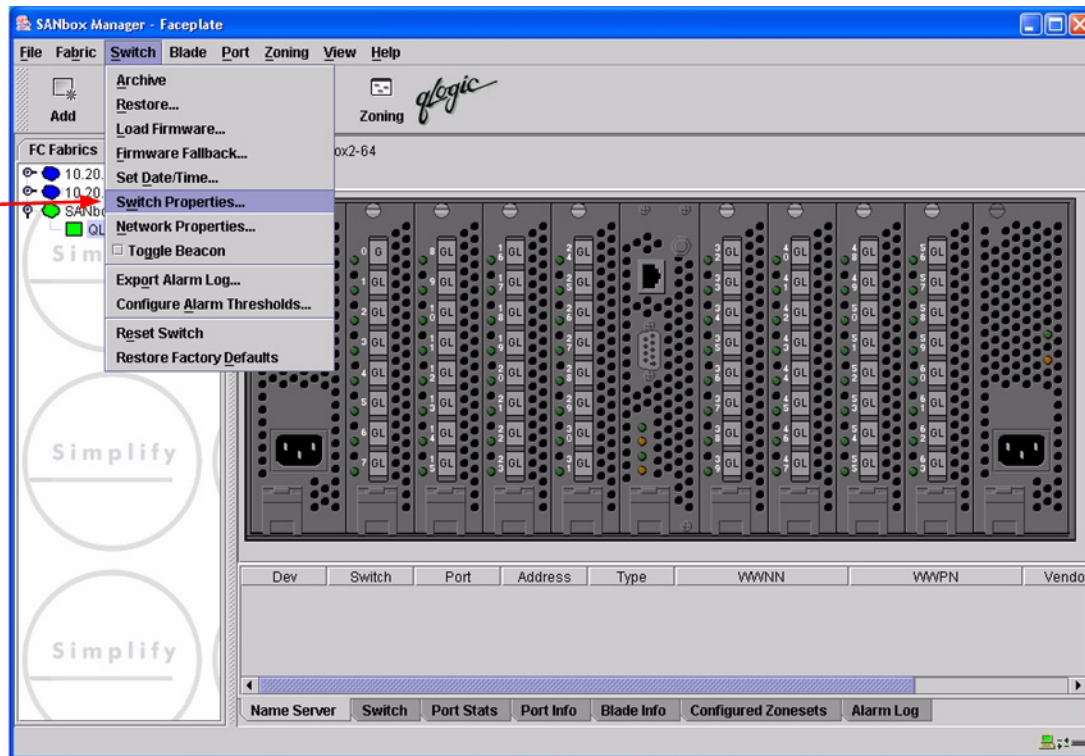
Not applicable.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
Operational State: online Firmware Version: V1.3-56-0
Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16

Chassis Name: SANbox2
Administrative State: online
Domain ID: 1
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
Operational State: online Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1

Chassis Name: QLogic SANbox2-64
Administrative State: online
Domain ID: 120
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable
In-band Management: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
DomainIDLock (True / False) [False] True
SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [10000]
E_D_TOV (decimal value, 10-20000 msec) [2000]
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```

Timeout Values

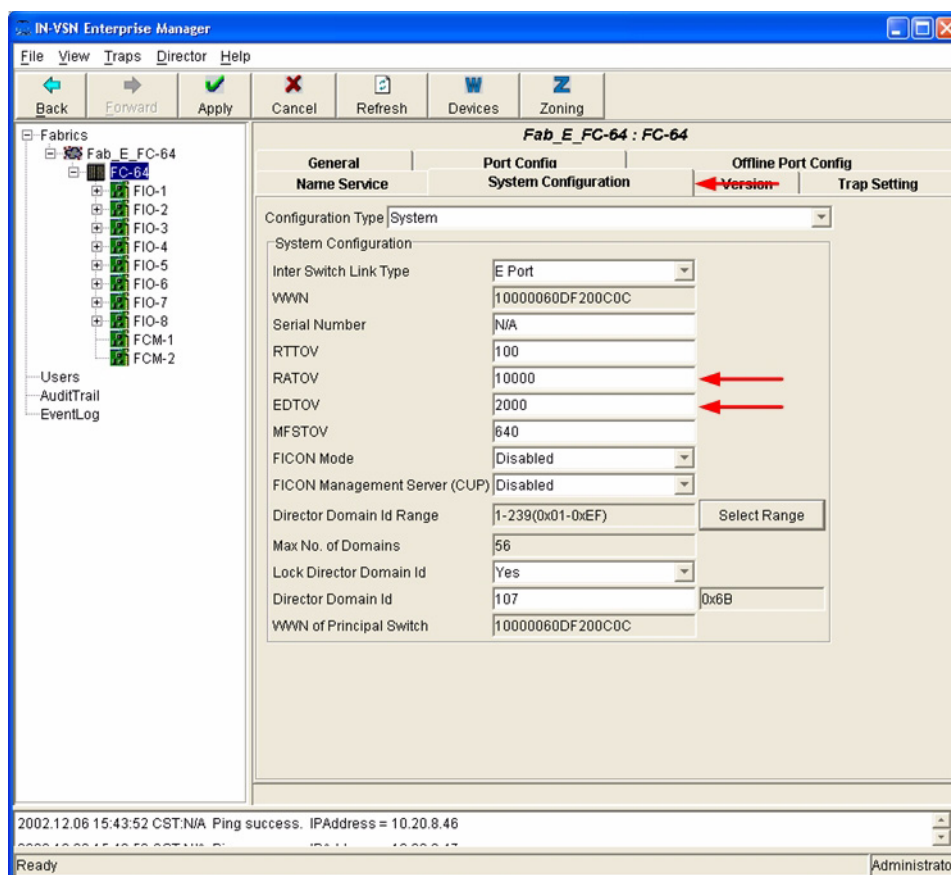
As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

R_A_TOV = 10 seconds
E_D_TOV = 2 seconds

This section provides the steps to change these values.

INRANGE IN-VSN Enterprise Manager

1. Start the INRANGE IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays.
2. From the **IN-VNS Enterprise Manager** dialog box, select the **System Configuration** tab. Verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, do the following.
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **Apply**.



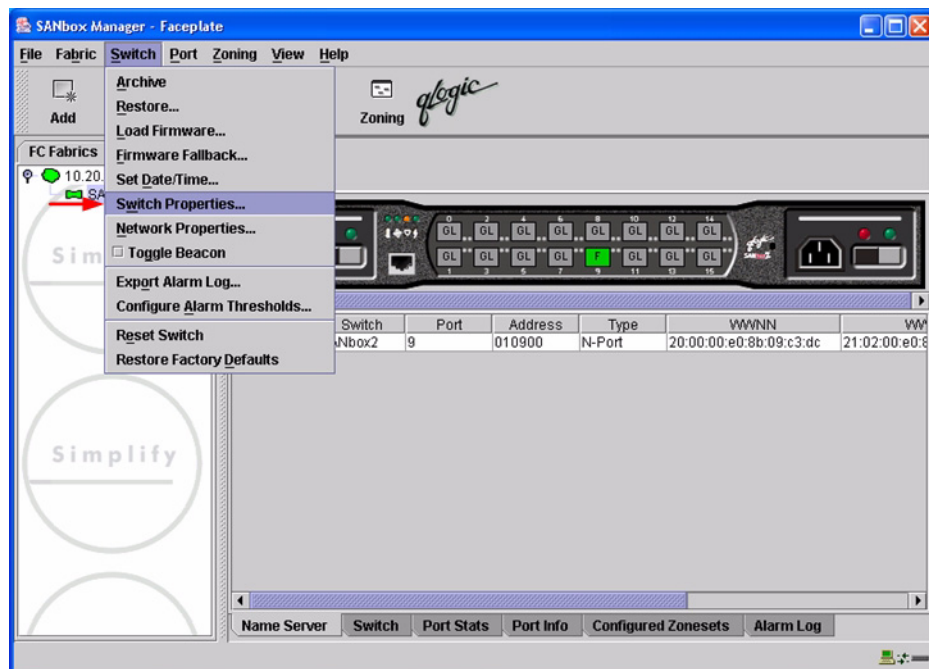
INRANGE CLI

Not applicable.

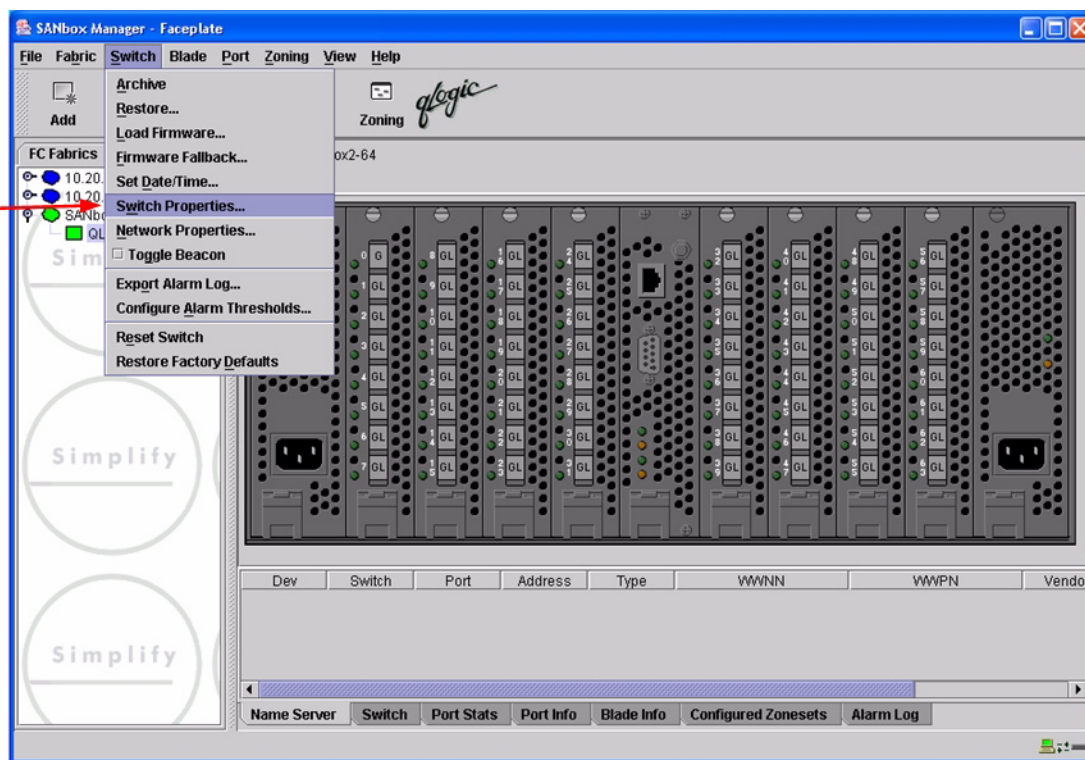
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

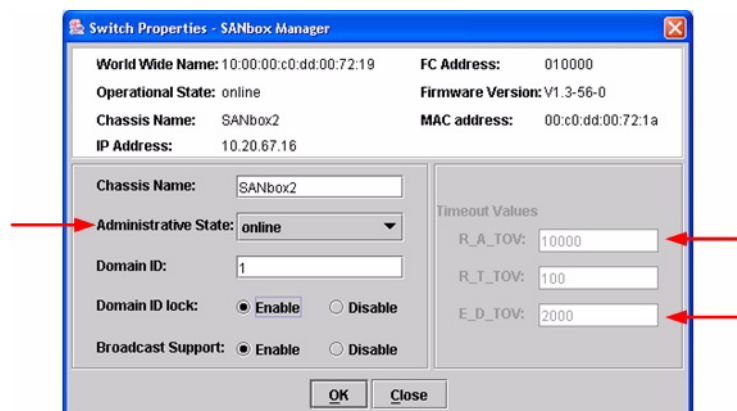


For the QLogic SANbox2-64, the following displays:

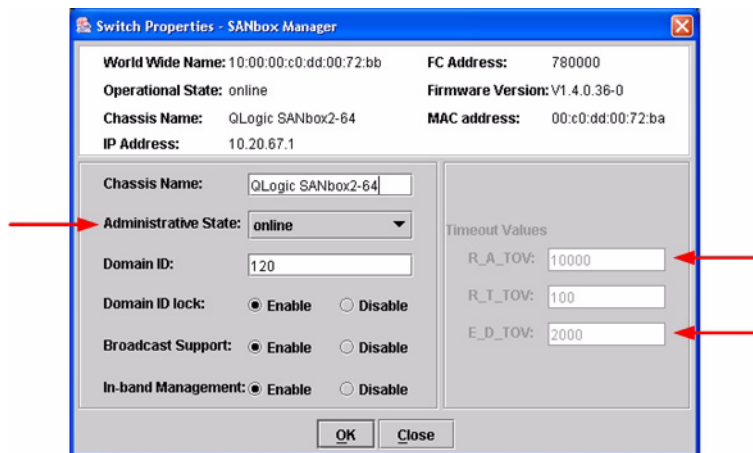


3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

INRANGE switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

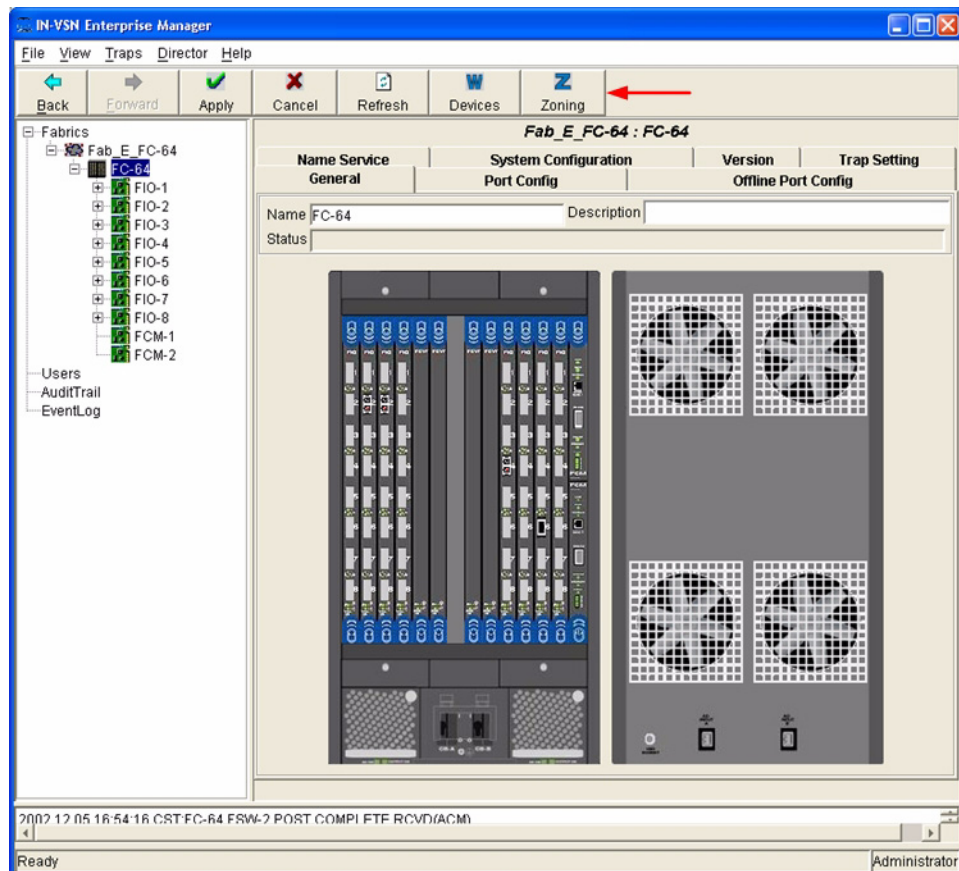
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

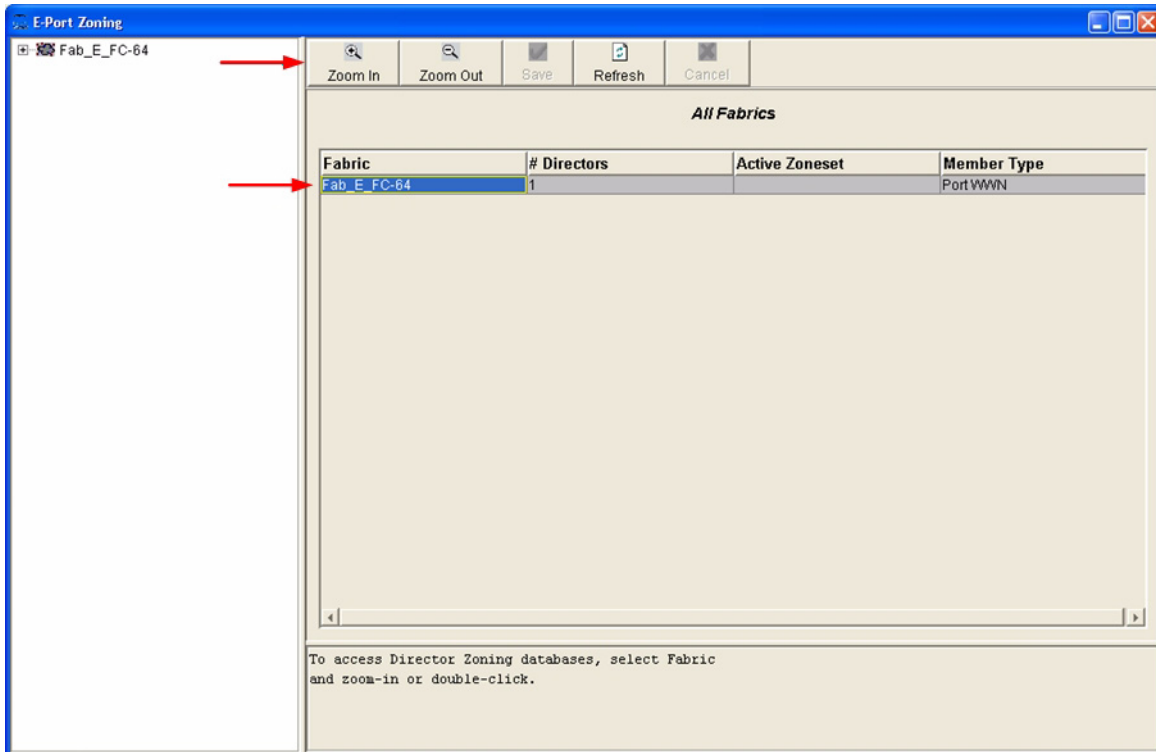
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

INRANGE IN-VSN Enterprise Manager

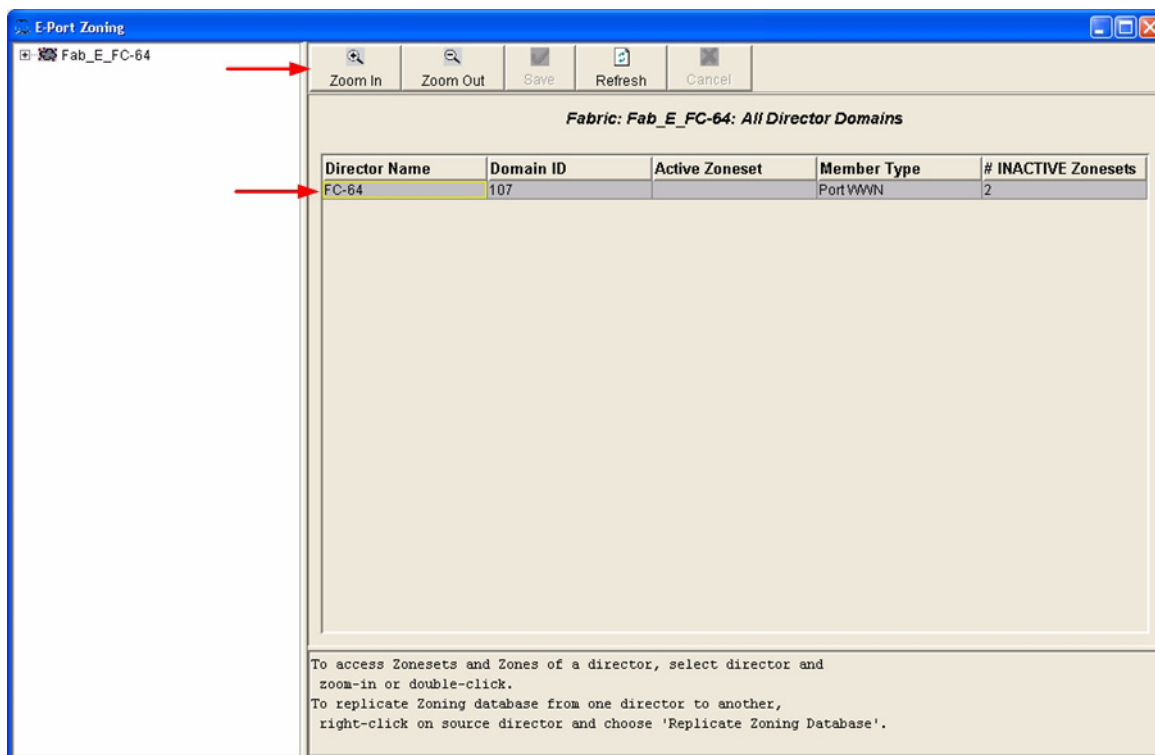
1. Start the INRANGE IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays. Click the **Zoning** button.



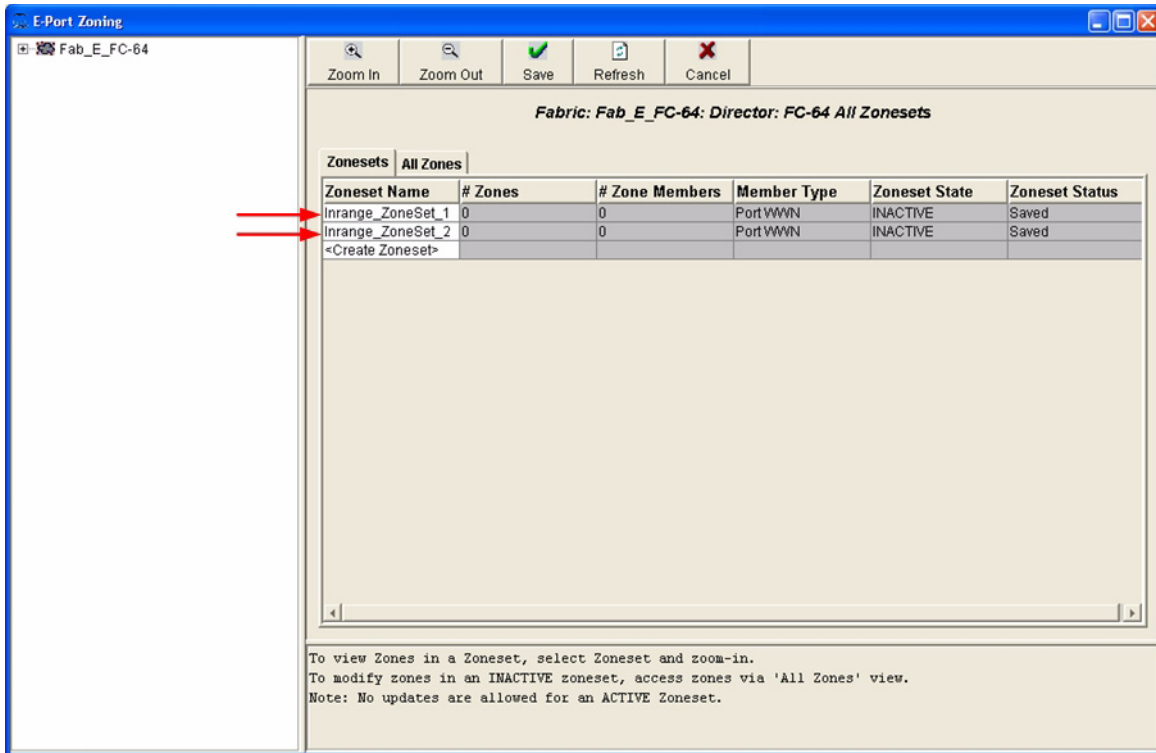
- From the **E-Port Zoning (All Fabrics)** dialog box, select the fabric and click the **Zoom In** button.



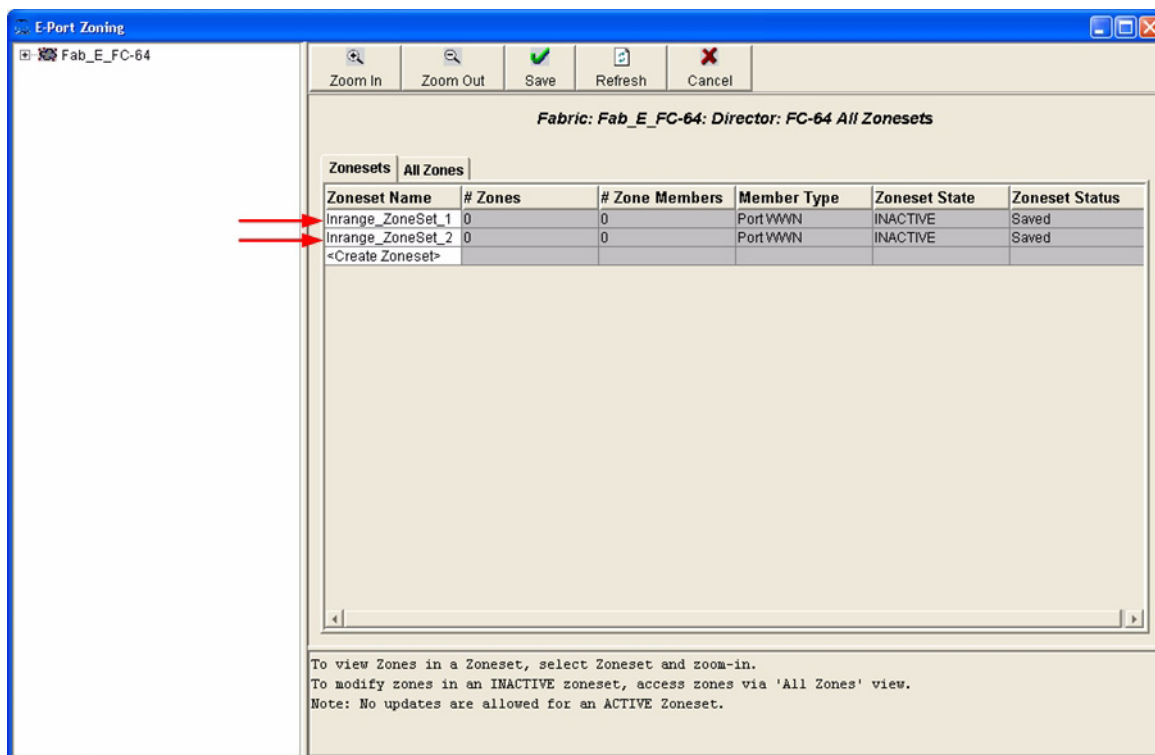
3. From the **E-Port Zoning (Fabric x: All Director Domains)** dialog box, select the director and click the **Zoom In** button.



4. From the **E-Port Zoning (Fabric x: Director y: All Zonesets)** dialog box, select the **Zonesets** tab. Verify that all Zone Set names conform to the standards for zone naming as discussed under [“Active Zone Set Names” on page 161](#).



5. Select the **All Zones** tab. Verify that all Zone names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 161.

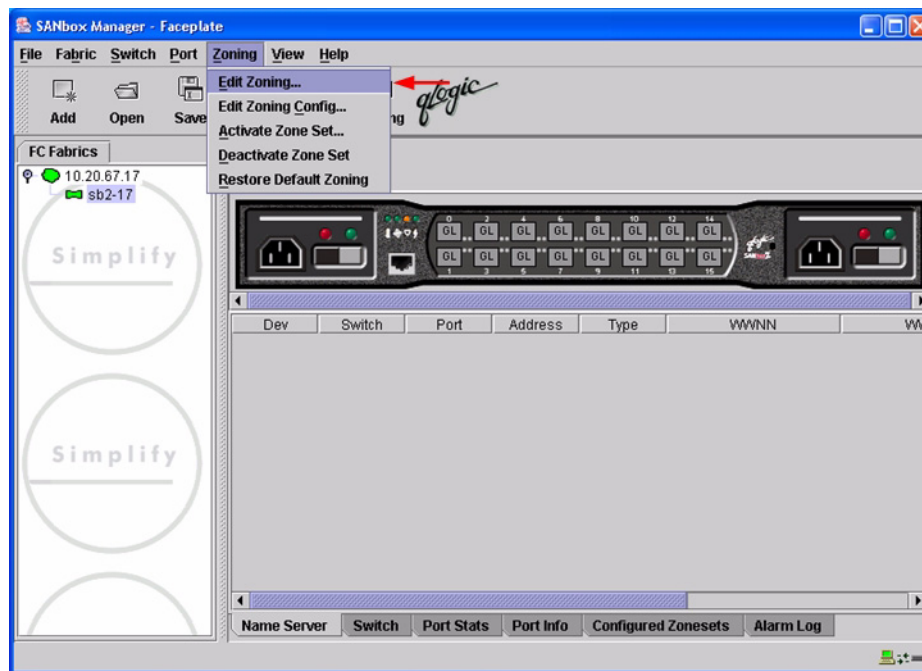


INRANGE CLI

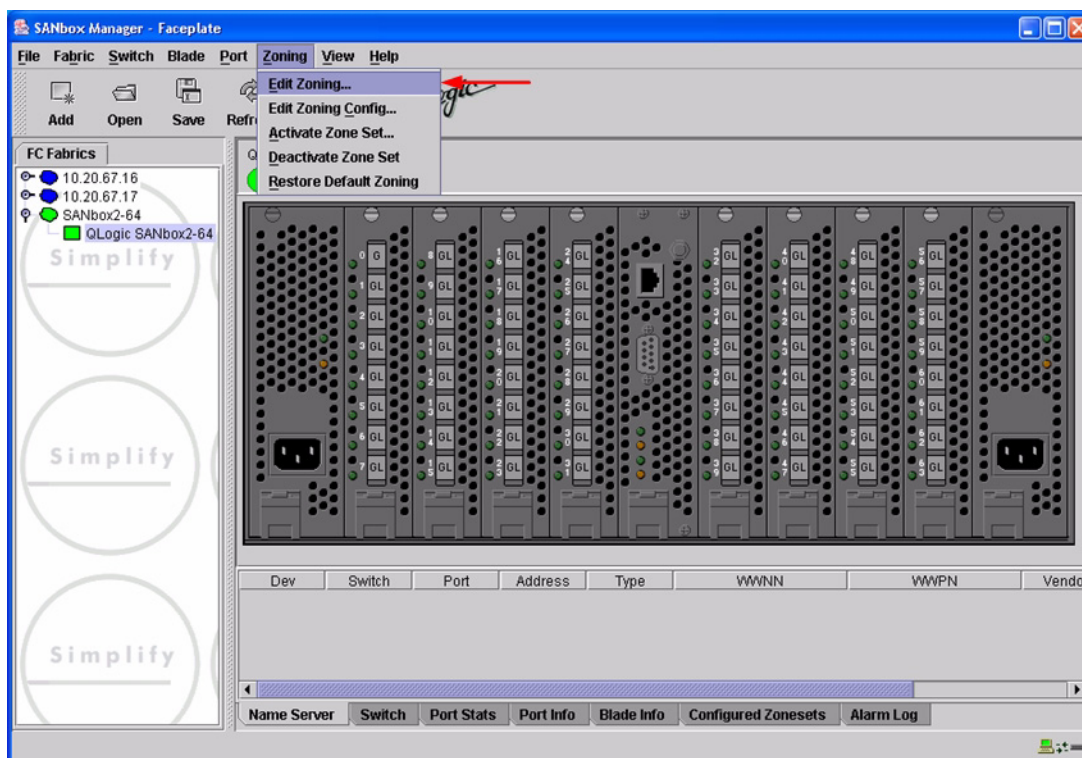
Not applicable.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

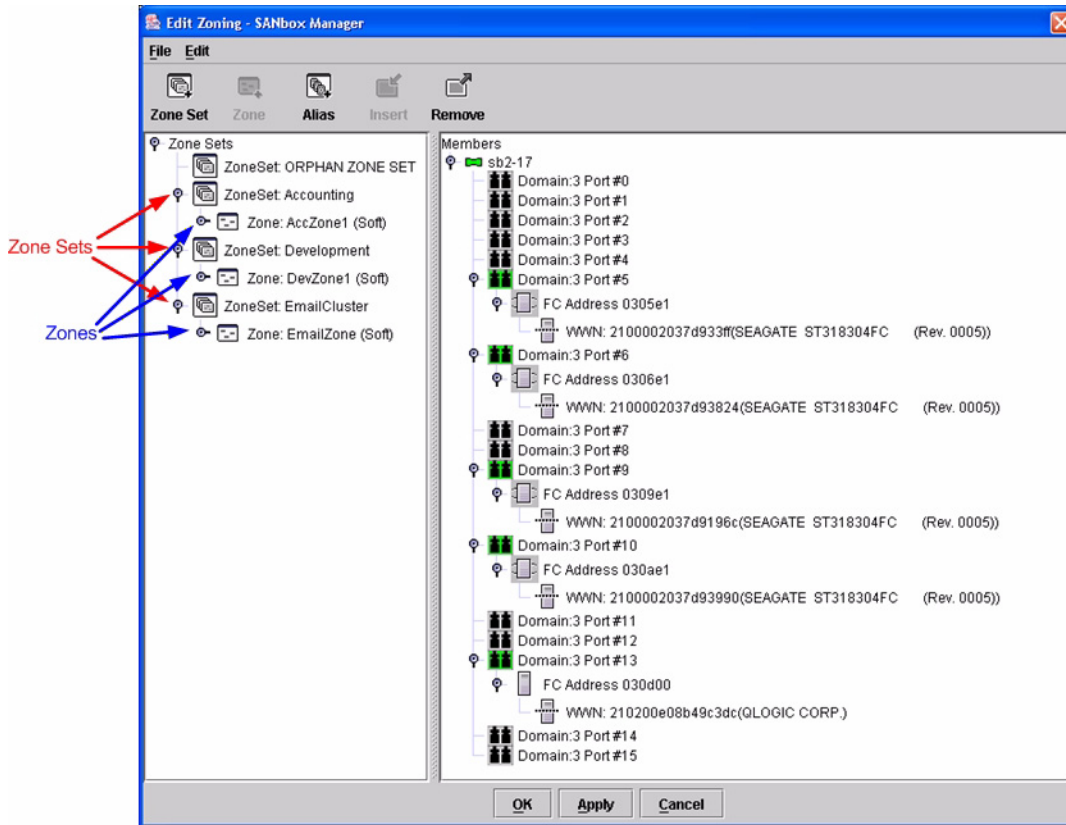


For the QLogic SANbox2-64, the following displays:

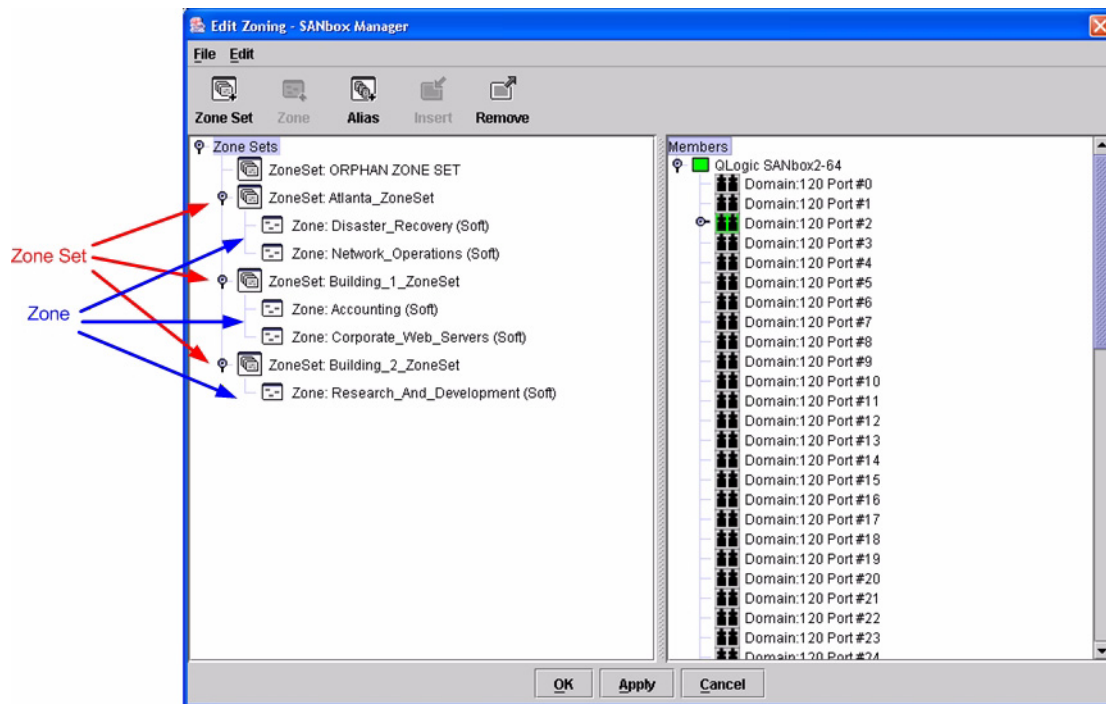


- From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 161.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

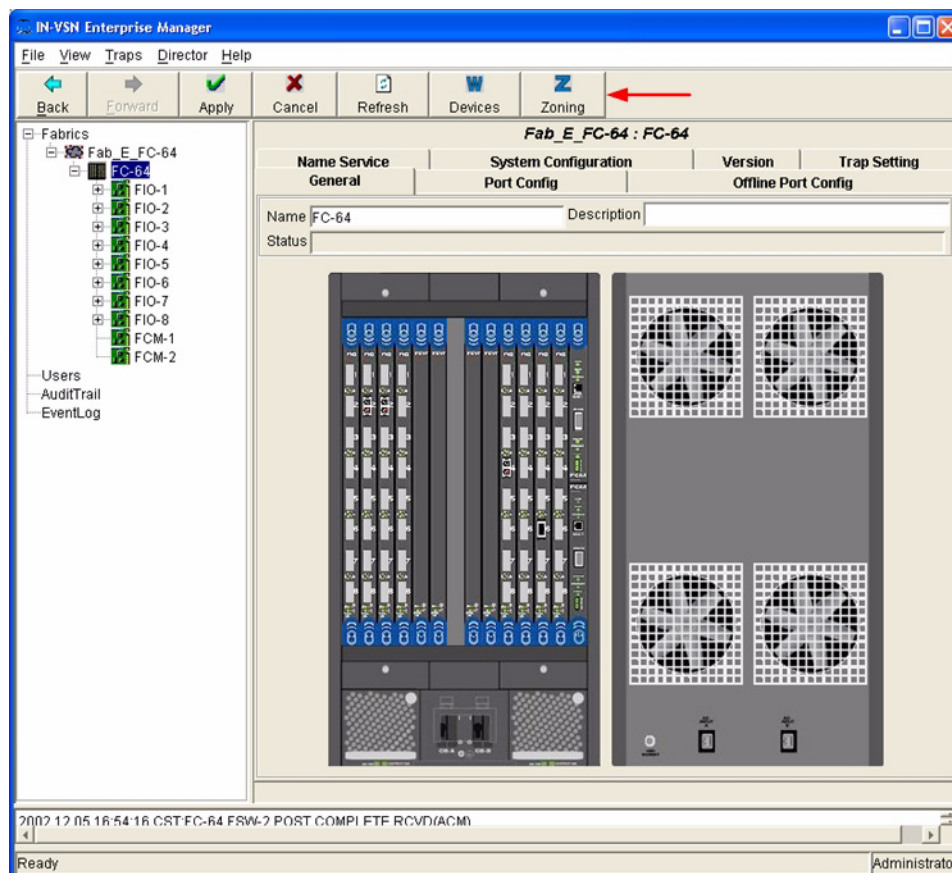
Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

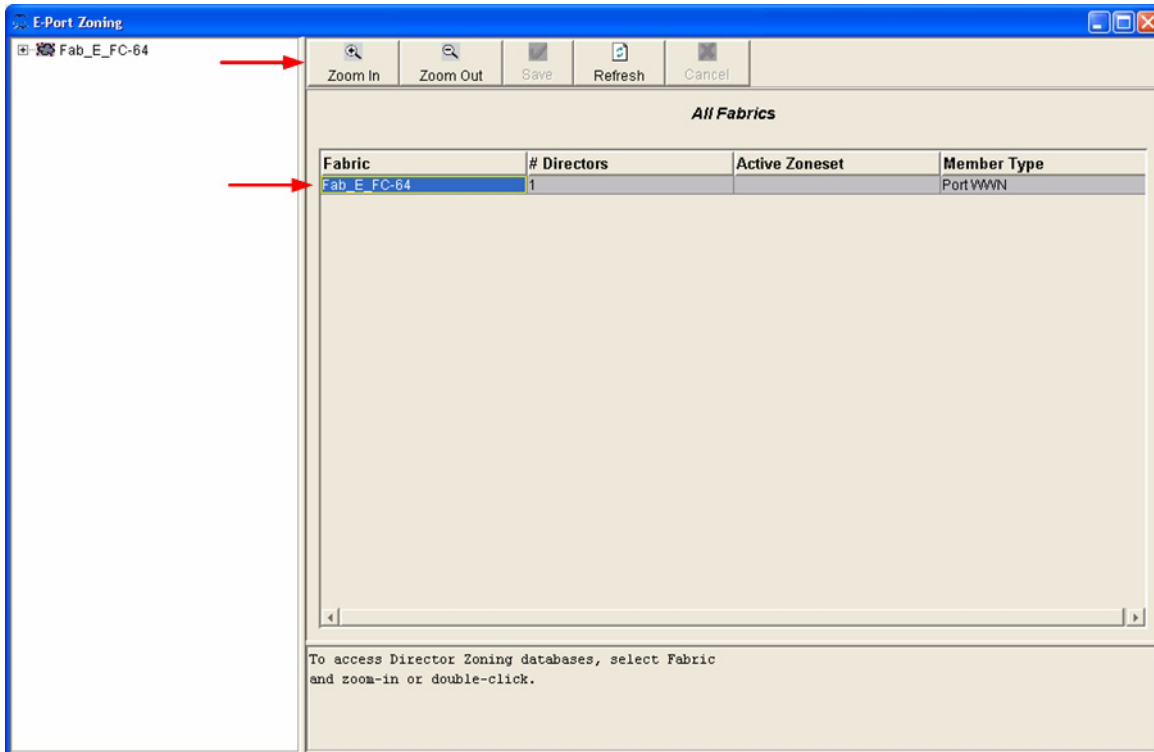
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

INRANGE IN-VSN Enterprise Manager

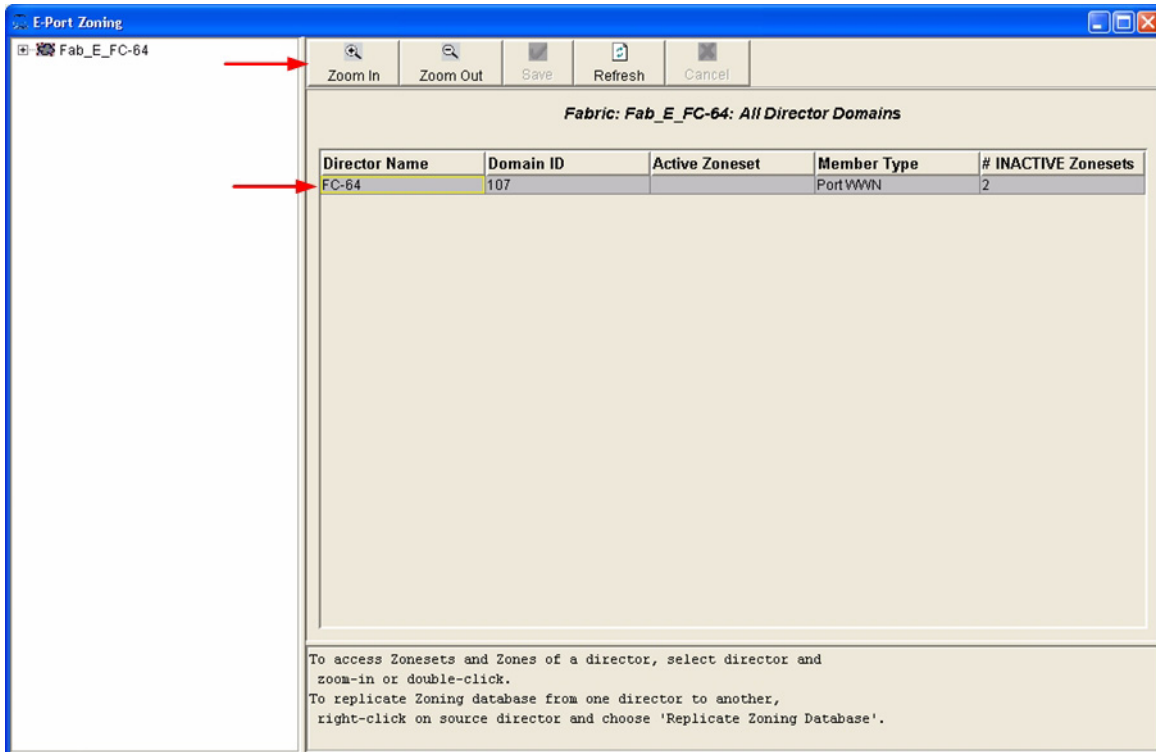
1. Start the INRANGE IN-VSN Enterprise Manager. The **IN-VNS Enterprise Manager** dialog box displays. Click the **Zoning** button.



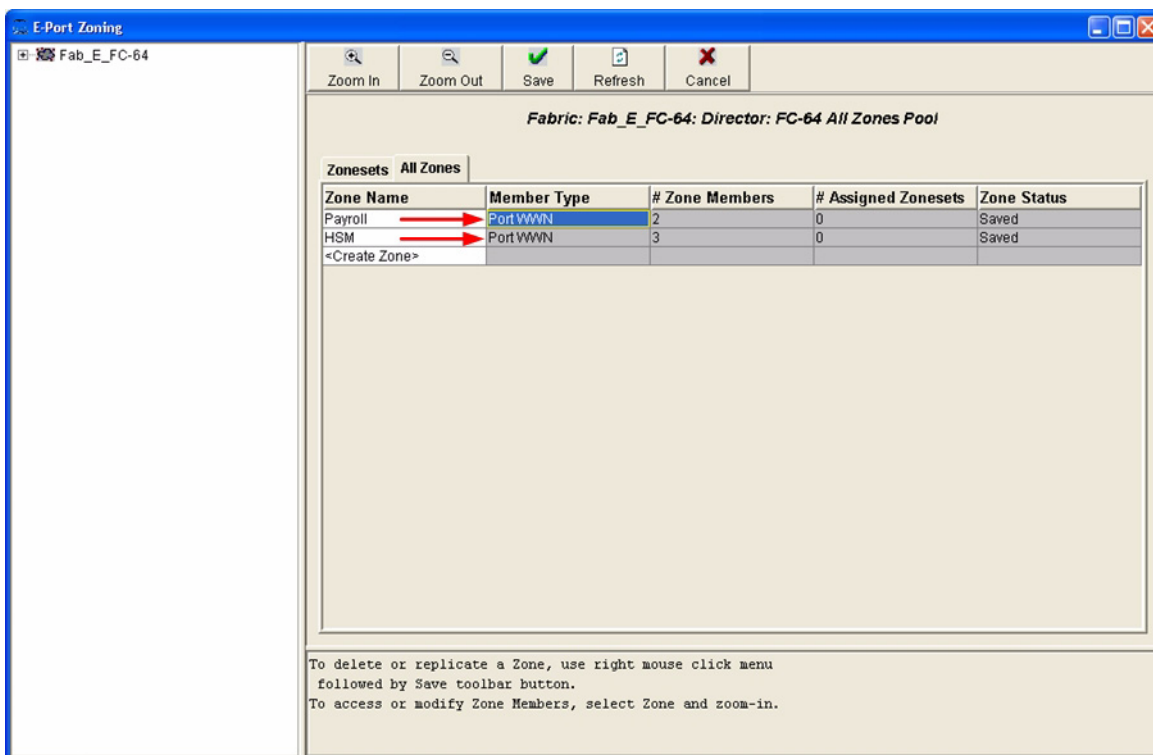
2. From the **E-Port Zoning (All Fabrics)** dialog box, select the fabric and click the **Zoom In** button.



- From the **E-Port Zoning (Fabric x: All Director Domains)** dialog box, select the director and click the **Zoom In** button.



4. From the **E-Port Zoning (Fabric x: Director y: All Zones)** dialog box, select the **All Zones** tab. Verify that all **Zone Member Types** are set to **Port WWN**.

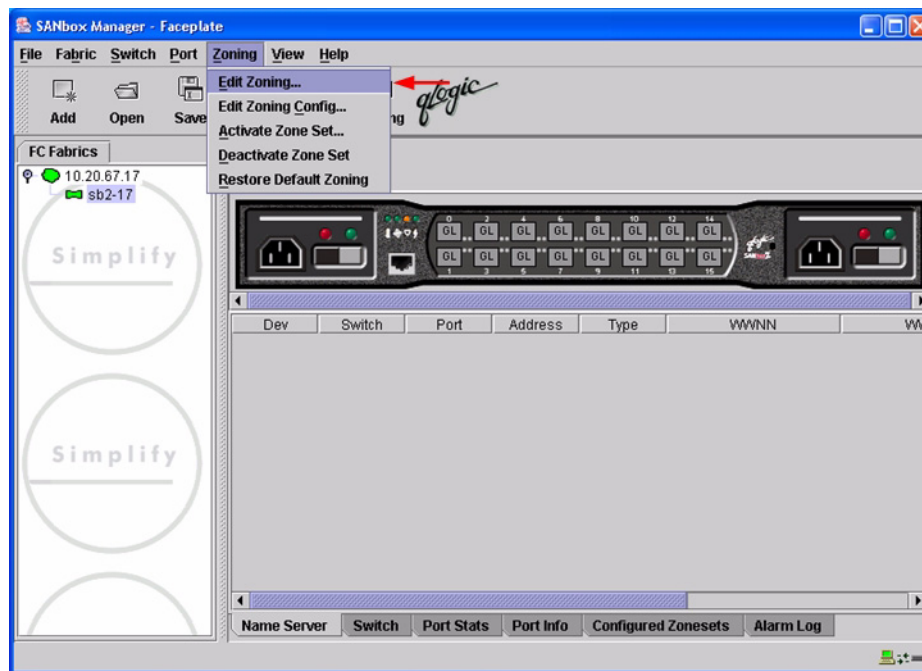


INRANGE CLI

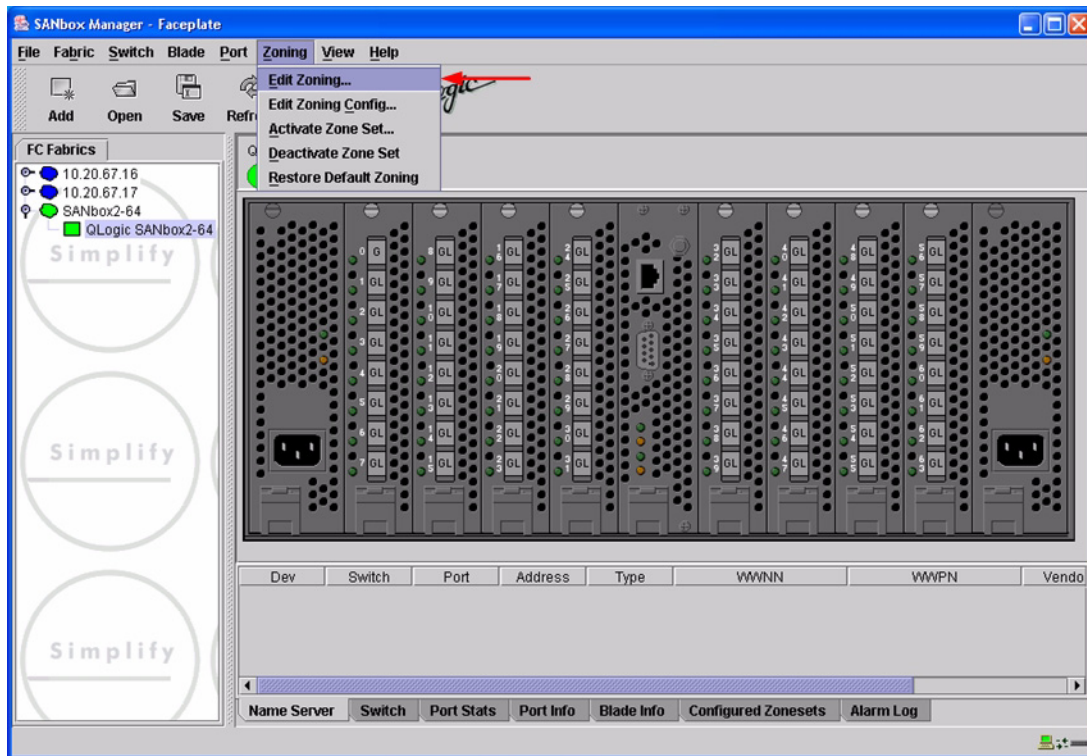
Not applicable.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

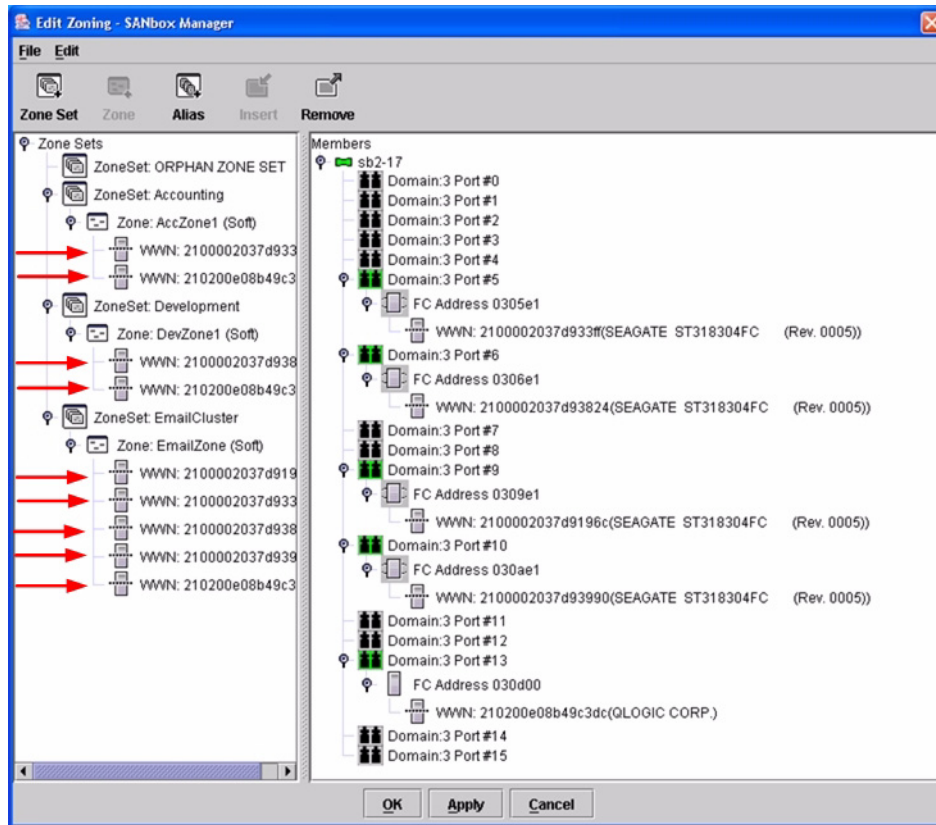


For the QLogic SANbox2-64, the following displays:

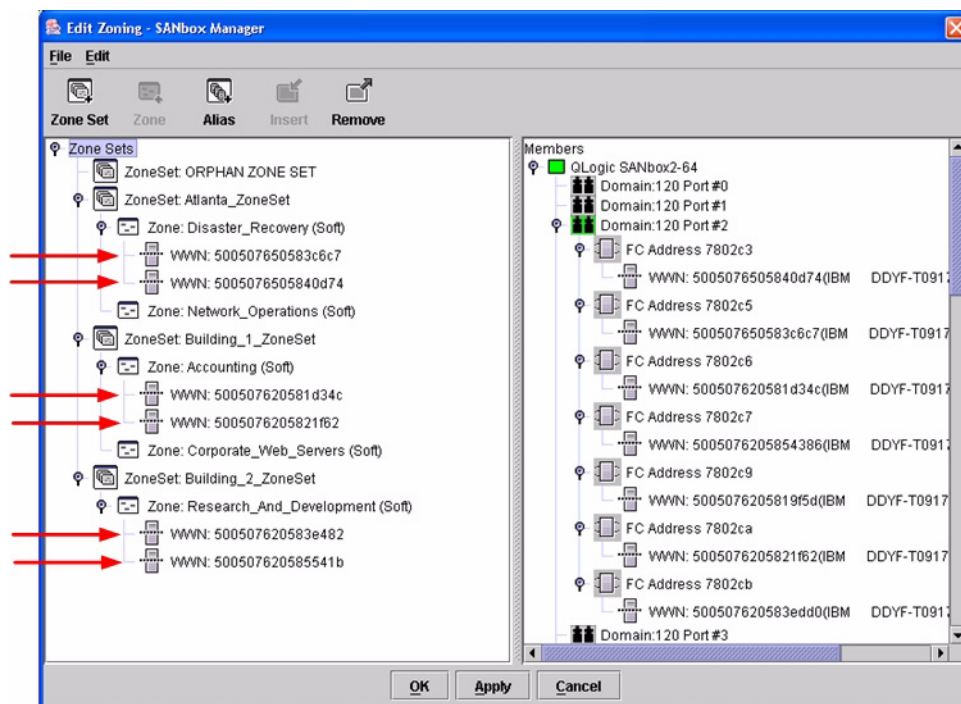


3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2#> **zone list <zone name>**

Confirm that only WWNs are listed.

Operating Mode Configuration

Not applicable.

INRANGE Specific Configuration

Not applicable.

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the INRANGE and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

Merging QLogic and McDATA Fabrics

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switch from McDATA that complies with the FC-SW-2 standard.

QLogic and McDATA Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
McDATA	Sphereon 4500 Switch	04.01.00 12 and above
	Intrepid 6064 Director	04.01.02.4 and above
	Intrepid 6140 Director	04.01.02.4 and above

The following chapters provide detailed information about merging QLogic and McDATA fabrics:

- **McDATA Sphereon 4500 Switch** ([see page 183](#))
- **McDATA Intrepid 6000 Series Directors** ([see page 221](#))

McDATA Sphereon 4500 Switch

Integration Checklist

The following steps must be completed to successfully merge McDATA and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches and Firmware Versions” on page 184](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration” on page 184](#)).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values” on page 192](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names” on page 201](#)).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types” on page 208](#)).
 - ✓ Ensure that all McDATA switches are configured for Open Fabric Interoperability mode (see [“Operating Mode Configuration” on page 214](#)).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist” on page 219](#)).

Configuration Limitations

When merging McDATA and QLogic fabrics, a maximum of 31 interconnected switches per fabric can be configured. Otherwise, all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switch from McDATA that complies with the FC-SW-2 standard.

QLogic and McDATA Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
McDATA	Sphereon 4500 Switch	04.01.00 12 or above

Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the McDATA switch and the QLogic switch.

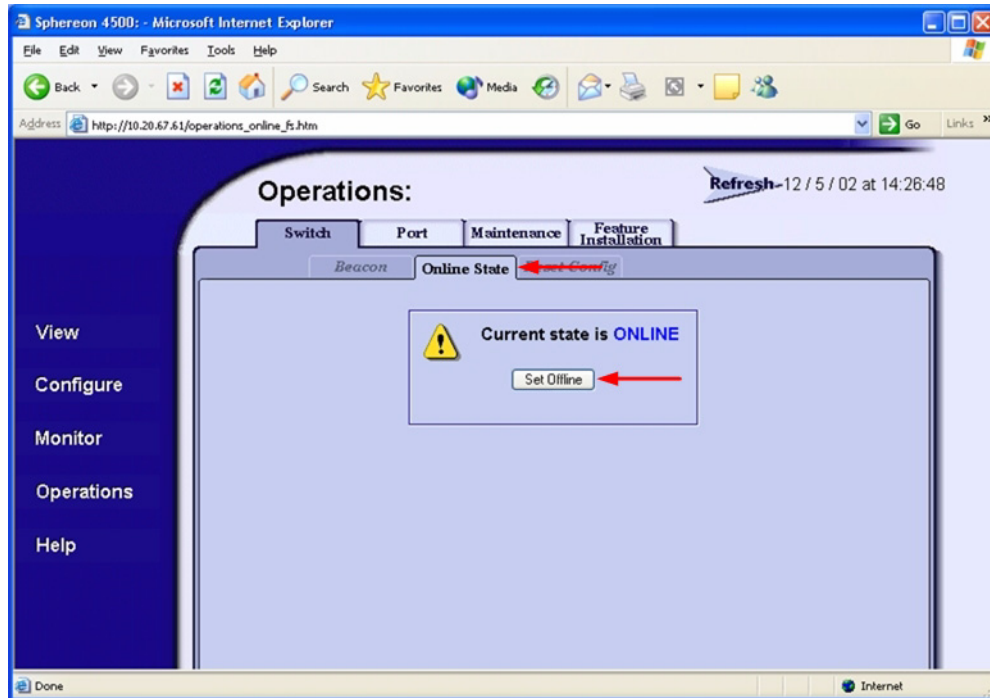
The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range. This is equivalent to 1–31 on the McDATA switch. The following chart lists the McDATA Domain ID and the corresponding QLogic Domain ID.

McDATA Versus QLogic Domain IDs

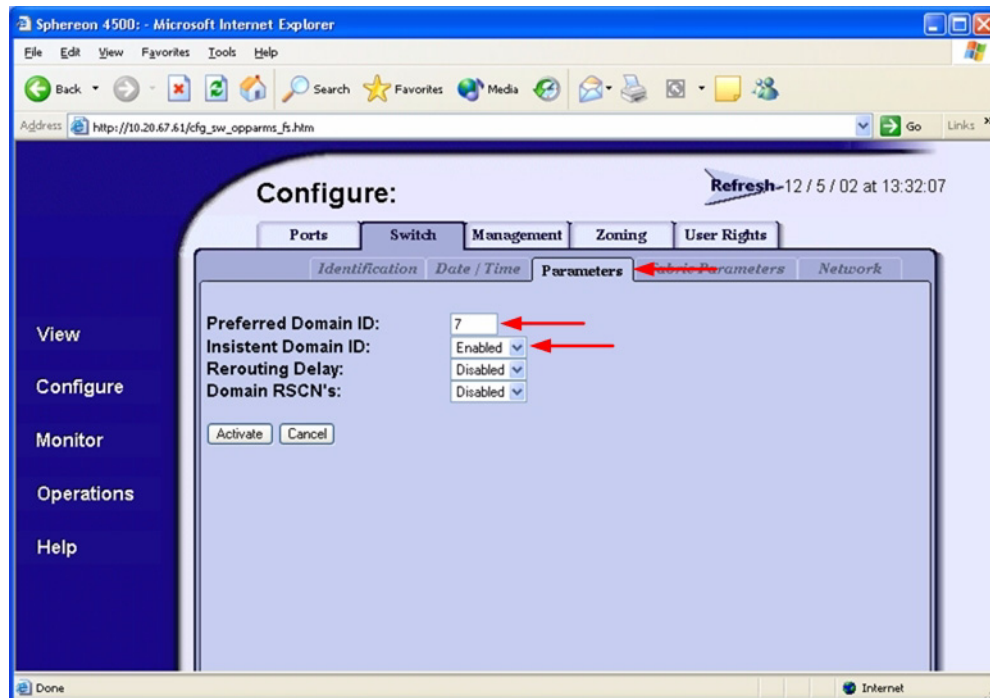
McDATA Domain ID	QLogic Domain ID	McDATA Domain ID	QLogic Domain ID	McDATA Domain ID	QLogic Domain ID
1	97	11	107	21	117
2	98	12	108	22	118
3	99	13	109	23	119
4	100	14	110	24	120
5	101	15	111	25	121
6	102	16	112	26	122
7	103	17	113	27	123
8	104	18	114	28	124
9	105	19	115	29	125
10	106	20	116	30	126
—	—	—	—	31	127

McDATA Sphereon Web Management

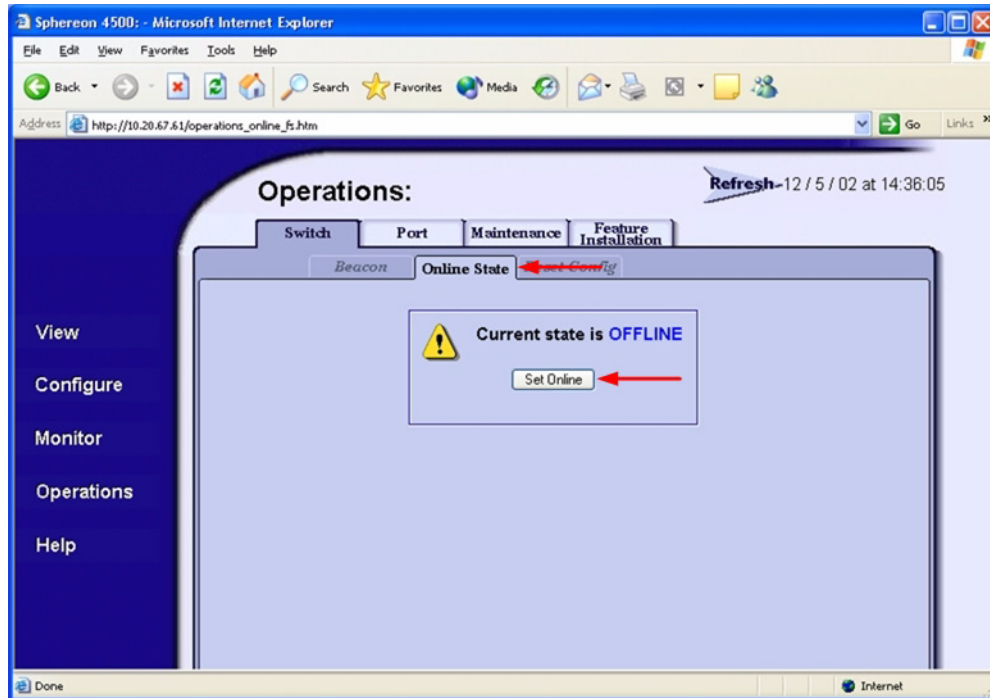
1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Offline** button.



3. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, select the **Parameters** tab, and do the following:
 - a. In the **Preferred Domain ID** box, type a unique Domain ID.
 - b. From the **Insistent Domain ID** list, select **Enabled**.
 - c. Click **Activate**.



4. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Online** button.



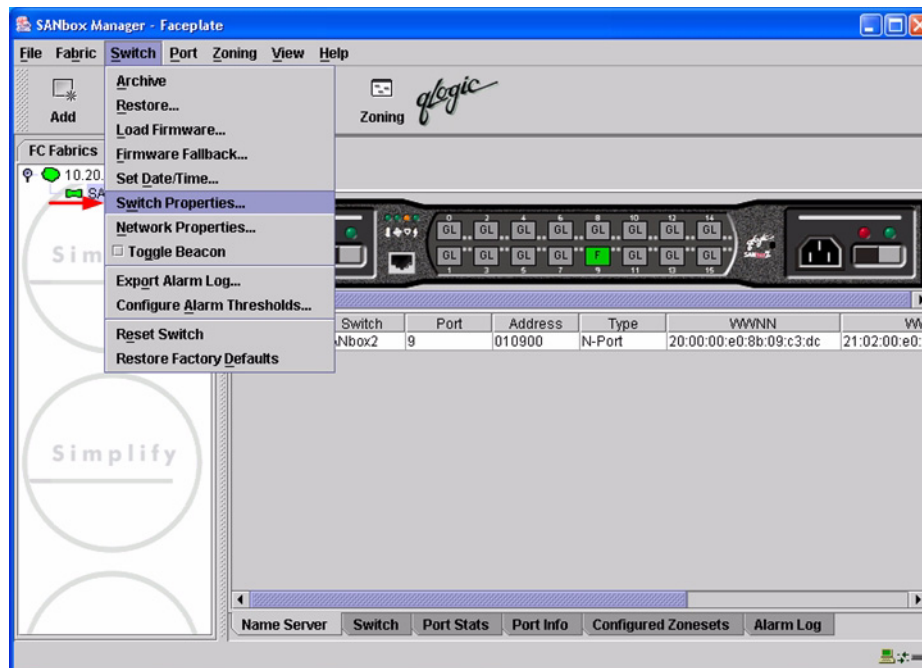
McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

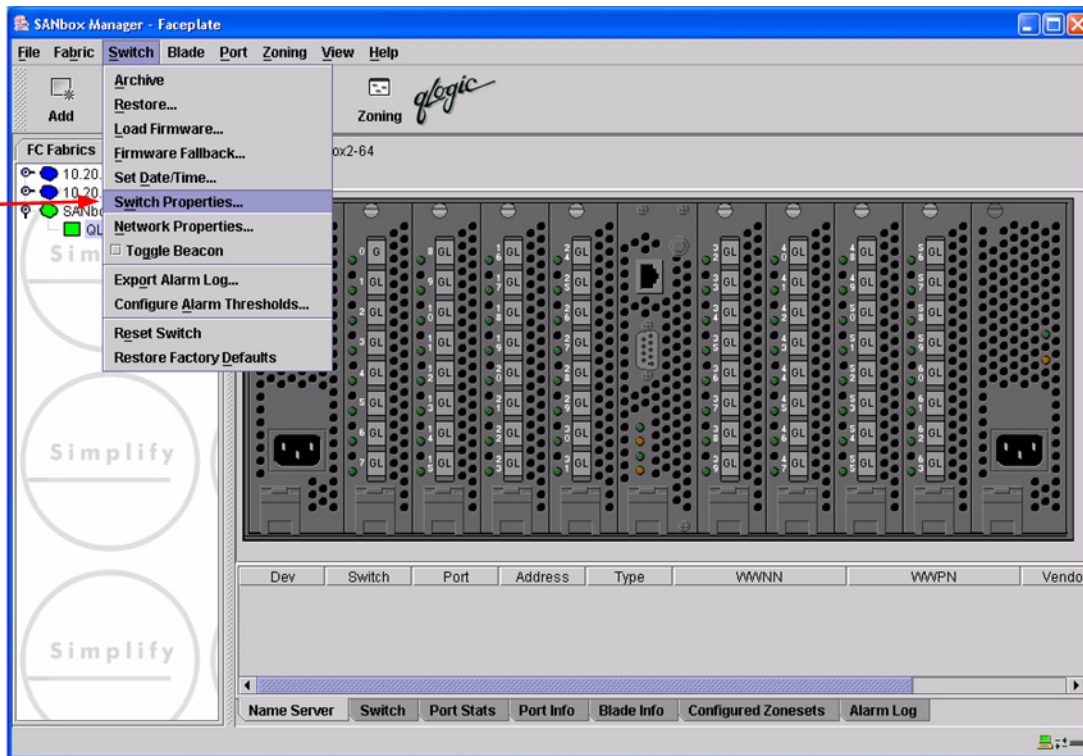
```
Username: Administrator
Password: xxxxxxxxx
Root> maint system
Maint.System> setOnlineState false
Maint.System> root
Root> config switch
Config.Switch> prefDomainId xx (xx=unique domain id)
Config.Switch> insistDomainId enable
Config.Switch> root
Root> maint system
Maint.System> setOnlineState true
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
Operational State: online Firmware Version: V1.3-56-0
Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16

Chassis Name: SANbox2
Administrative State: online
Domain ID: 1
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
Operational State: online Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1

Chassis Name: QLogic SANbox2-64
Administrative State: online
Domain ID: 120
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable
In-band Management: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **admin start**

SANbox2 (admin) #> **config edit**

SANbox2 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1] **<choose a unique number>**

DomainIDLock (True / False) [False] **True**

SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [10000]

E_D_TOV (decimal value, 10-20000 msec) [2000]

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> **config save**

SANbox2 (admin) #> **config activate**

The configuration will be activated. Please confirm (y/n): [n] **y**

Timeout Values

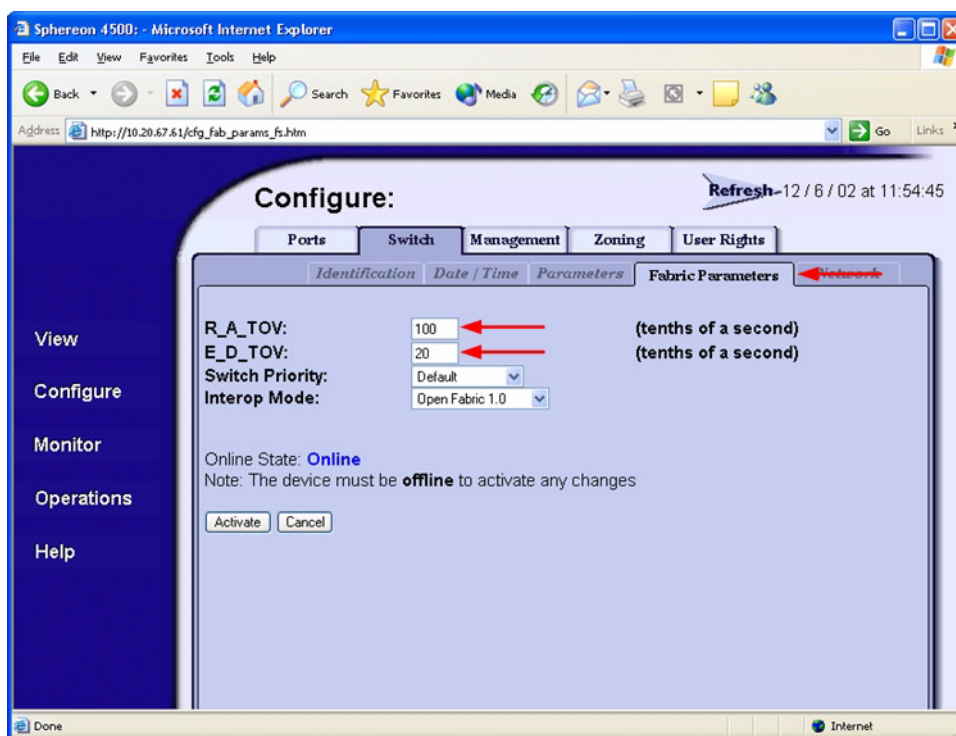
As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

R_A_TOV = 10 seconds
E_D_TOV = 2 seconds

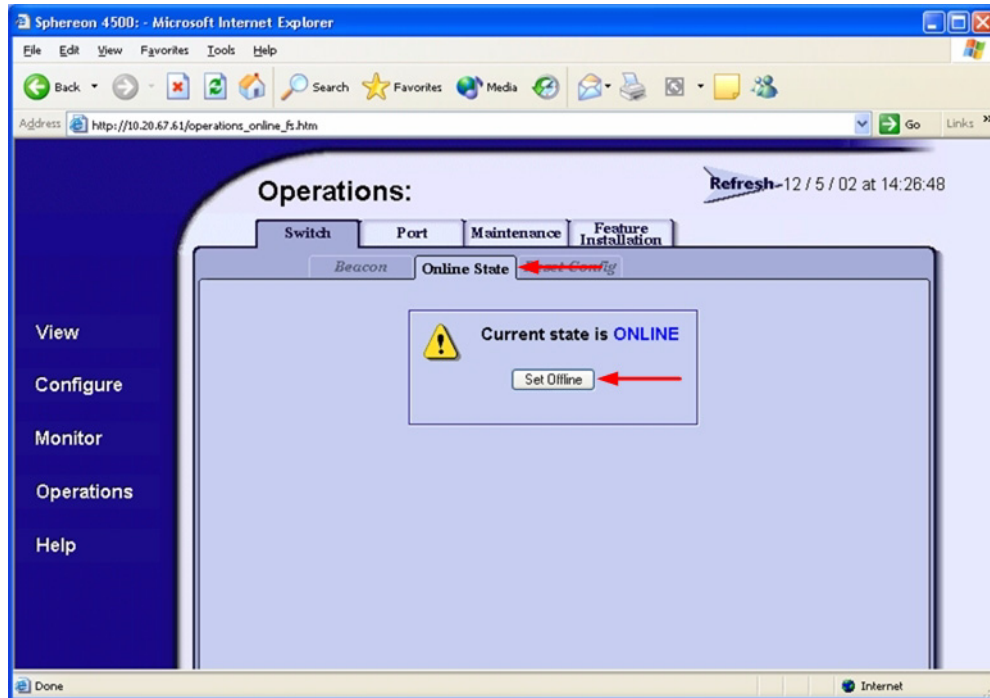
This section provides the steps to change these values.

McDATA Sphereon Web Management

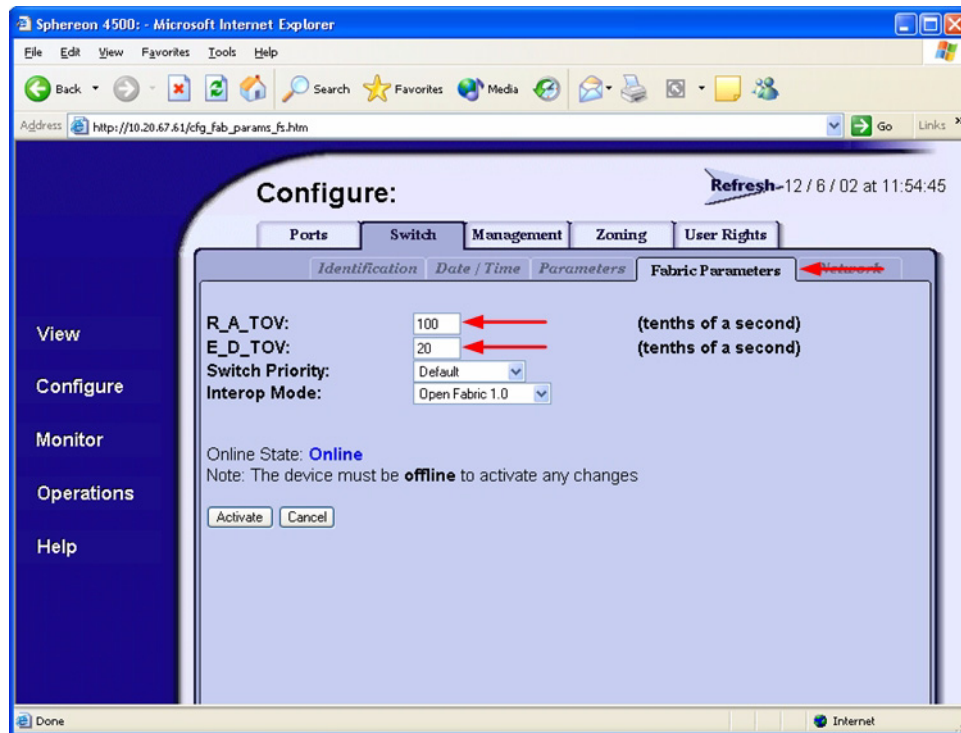
1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, then select the **Fabric Parameters** tab. Verify that **R_A_TOV** is set to **100** and **E_D_TOV** is set to **20**. If the settings are not correct, proceed to [step 3](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



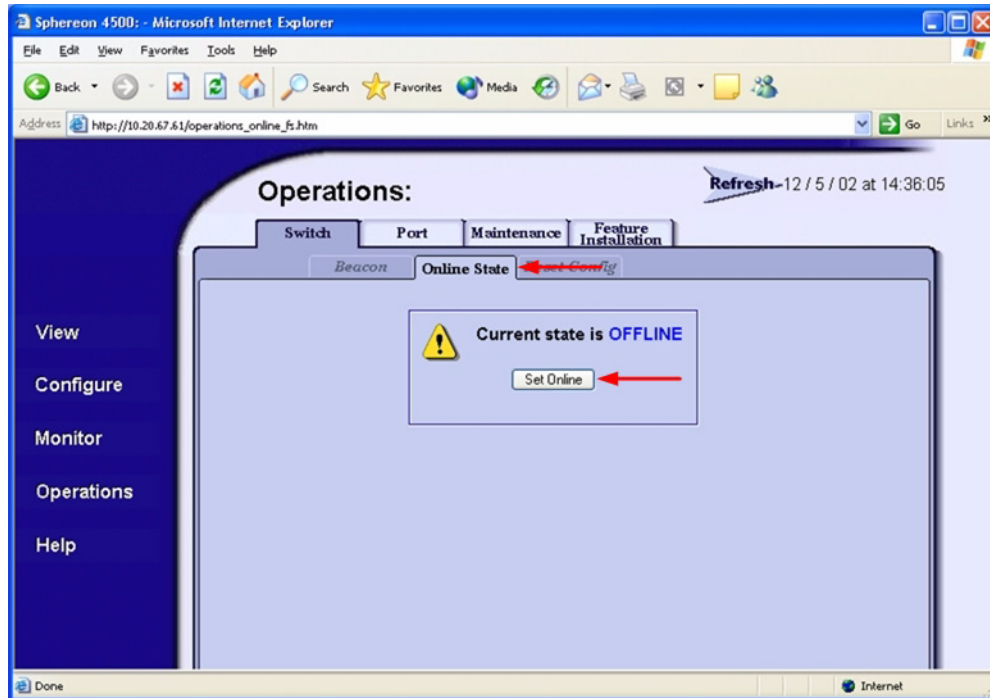
3. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select **Online State** tab, then click the **Set Offline** button.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, select the **Fabric Parameters** tab, then do the following:
 - a. In the **R_A_TOV** box, change the setting to **100**.
 - b. In the **E_D_TOV** box, change the setting to **20**.
 - c. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

```
Username: Administrator
```

```
Password: xxxxxxxx
```

```
Root> show
```

```
Show> switch
```

Use the above command to verify that R_A_TOV is set to 100 and E_D_TOV is set to 20. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
Show> root
```

```
Root> maint system
```

```
Maint.System> setOnlineState false
```

```
Maint.System> root
```

```
Root> config switch
```

```
Config.Switch> raTOV 100
```

```
Config.Switch> edTOV 20
```

```
Config.Switch> root
```

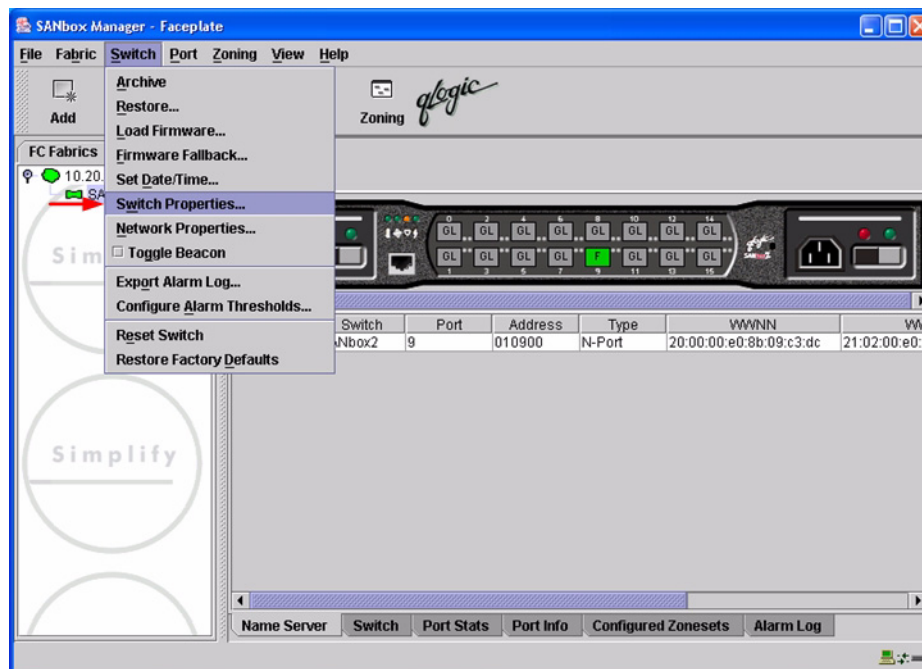
```
Root> maint system
```

```
Maint.System> setOnlineState true
```

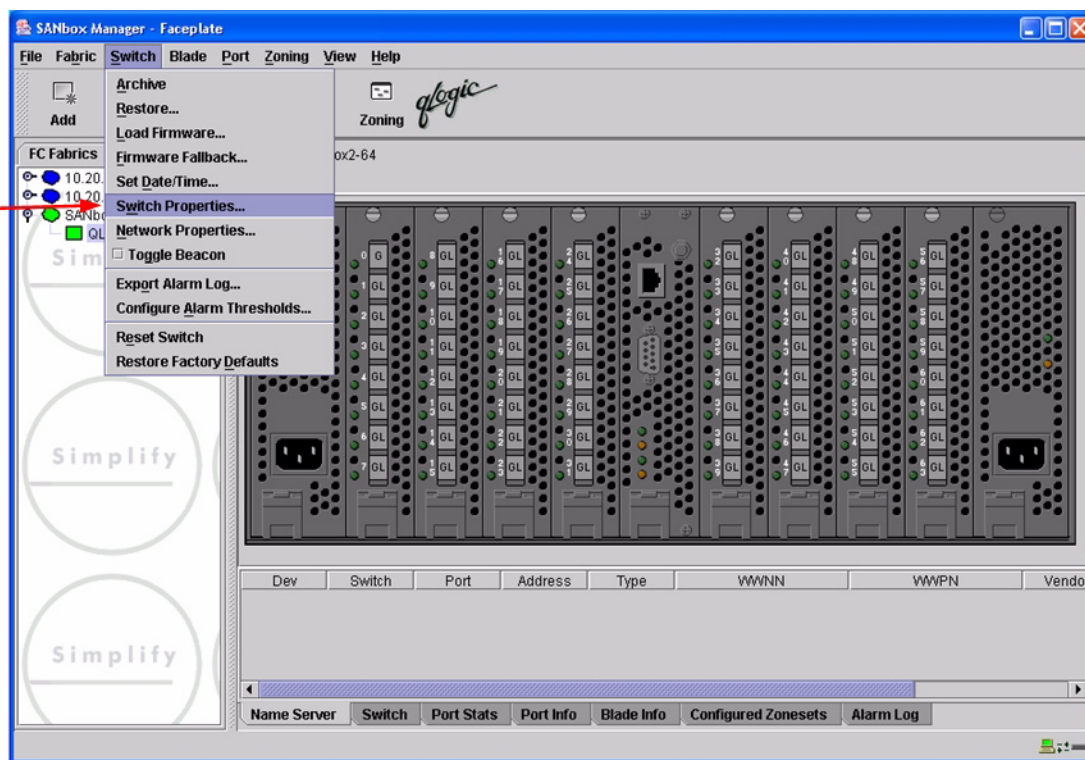
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

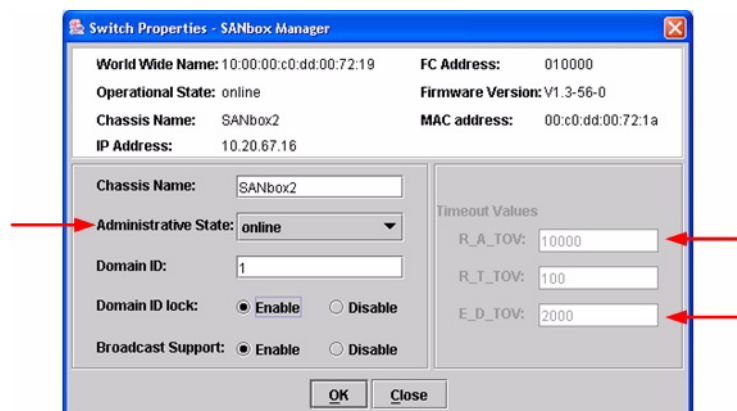


For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb	FC Address: 780000
Operational State: online	Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64	MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1	

Chassis Name: QLogic SANbox2-64

Administrative State: **online**

Domain ID: 120

Domain ID lock: ☒ Enable ☐ Disable

Broadcast Support: ☒ Enable ☐ Disable

In-band Management: ☒ Enable ☐ Disable

Timeout Values

R_A_TOV: 10000

R_T_TOV: 100

E_D_TOV: 2000

OK Close

4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

McDATA switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

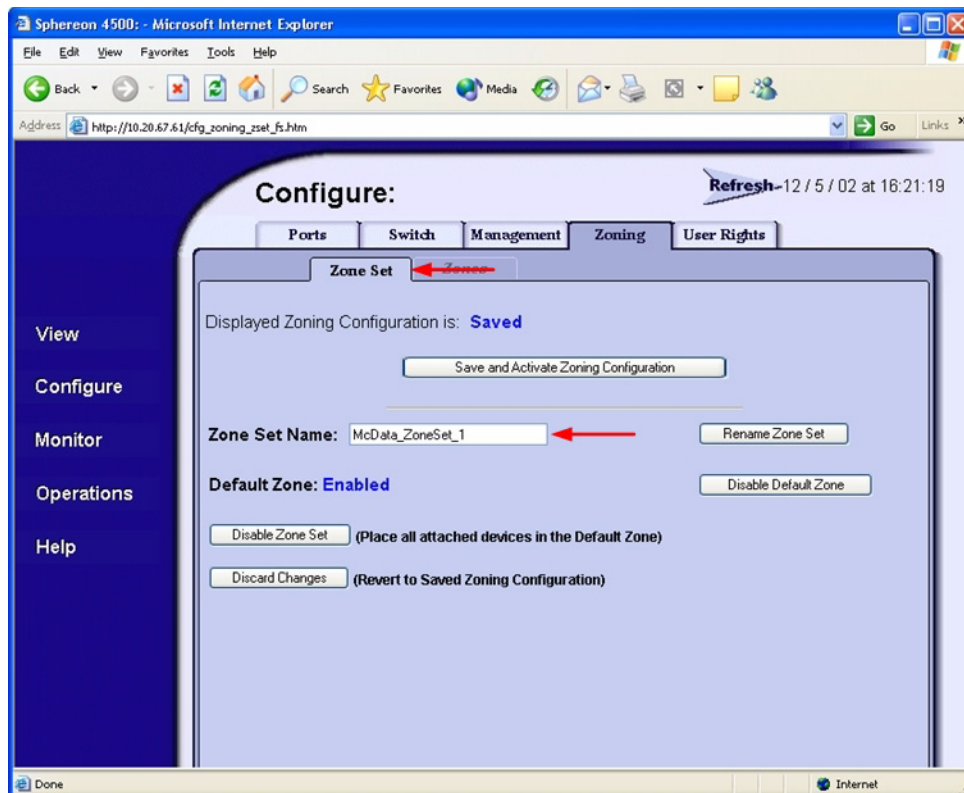
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

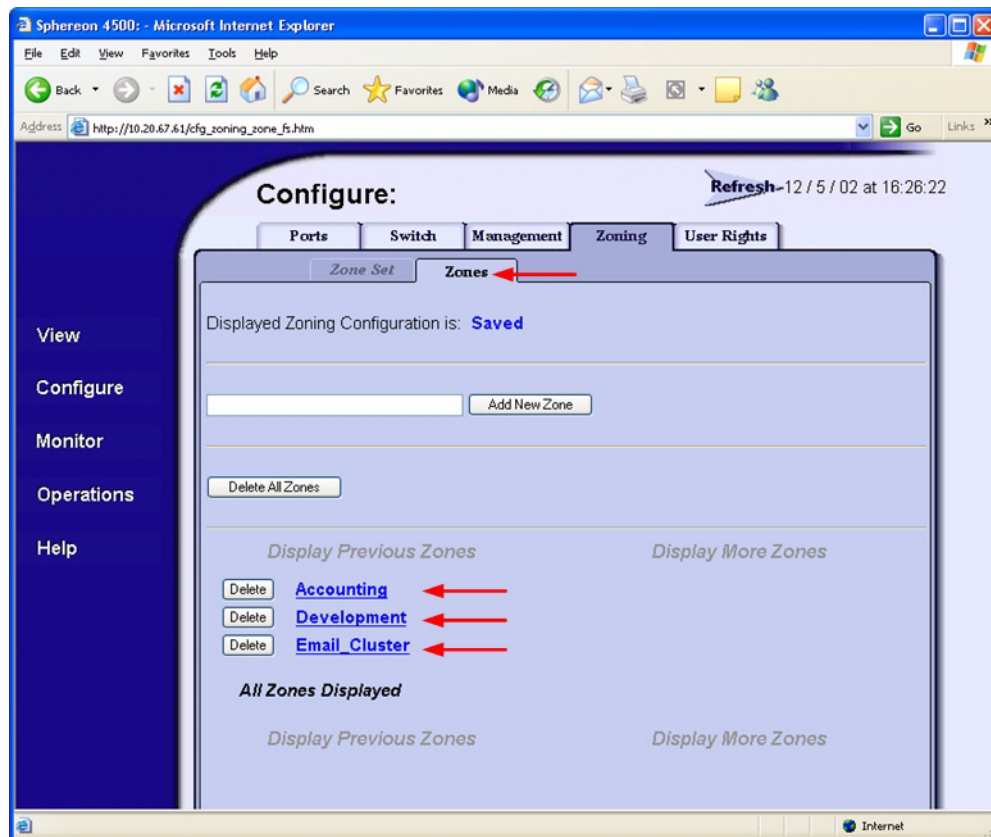
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

McDATA Sphereon Web Management

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **ZoneSet** tab. Verify that the Zone Set name conforms to the standards for zone naming as discussed under “[Active Zone Set Names](#)” on page 201.



- On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **Zones** tab. Verify that the Zone names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 201.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

Username: **Administrator**

Password: **xxxxxxxxxx**

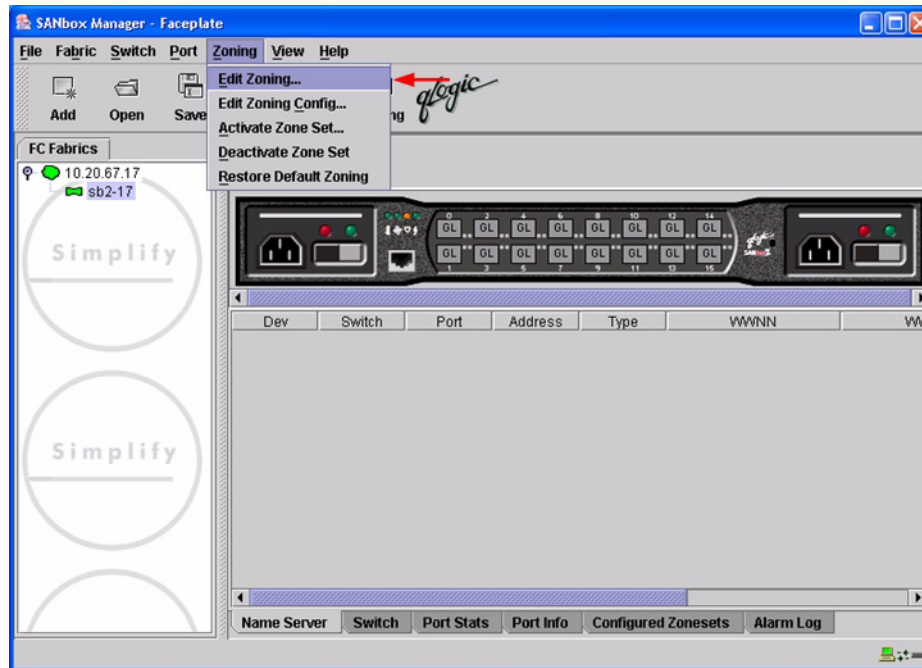
Root> **show**

Show> **zoning**

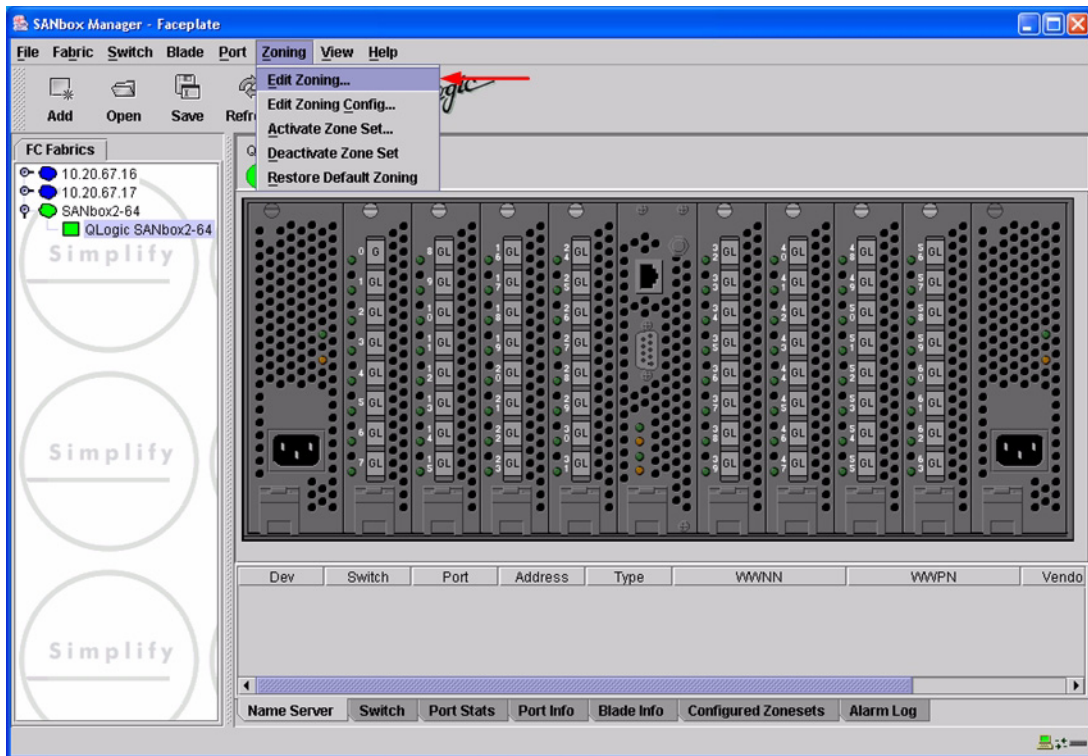
Verify that the Zone Set and Zone Names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 201.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

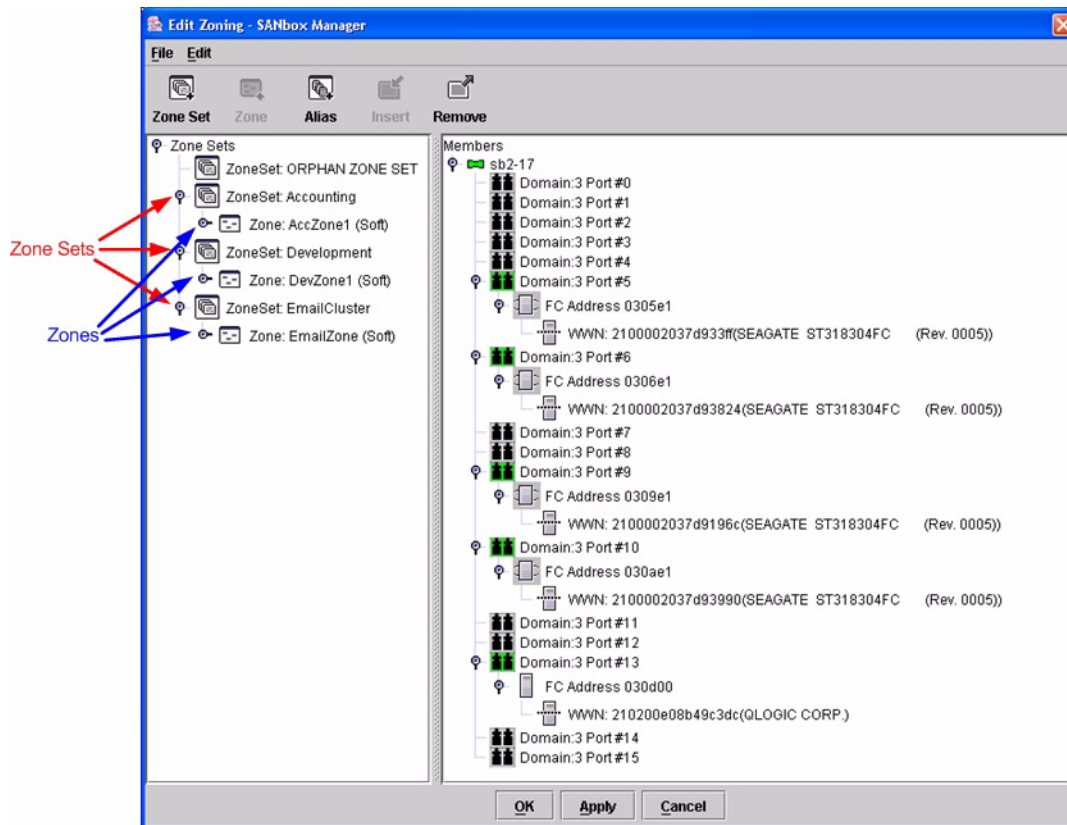


For the QLogic SANbox2-64, the following displays:

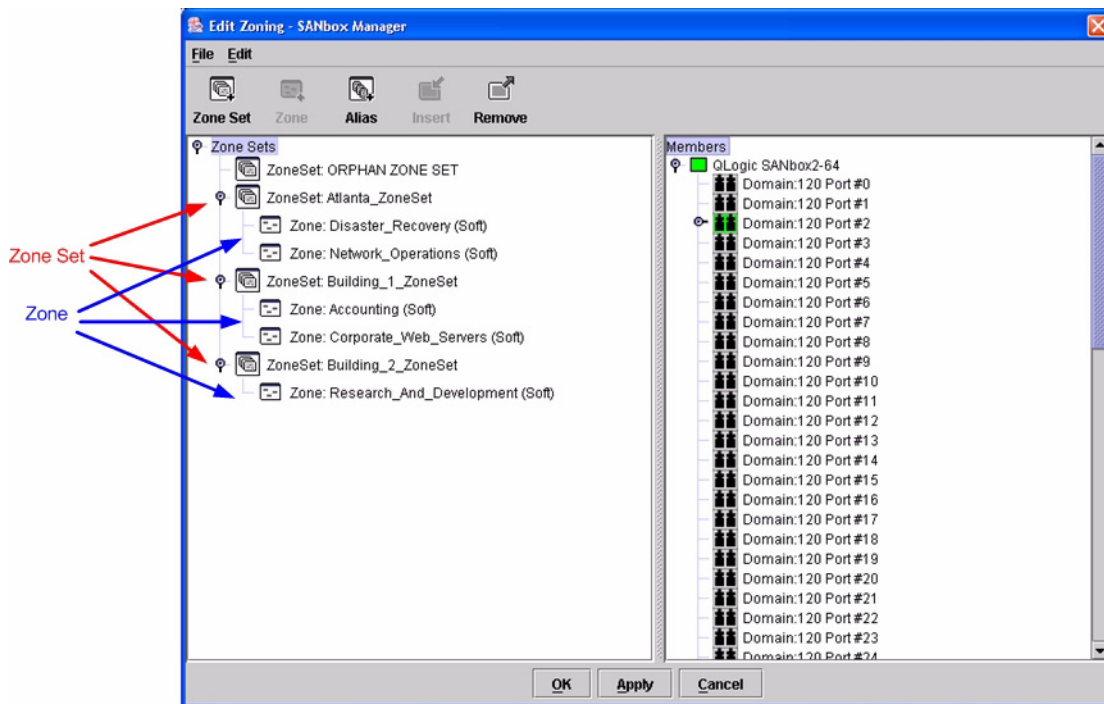


3. From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 201.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

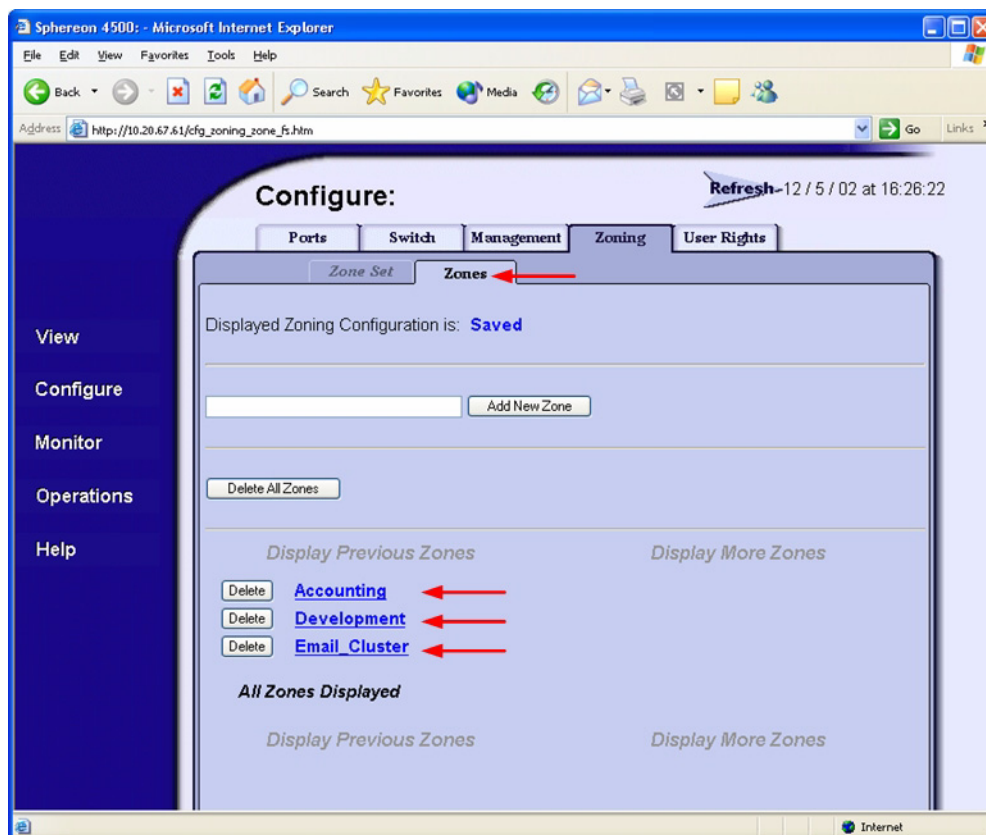
Zone Types

All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

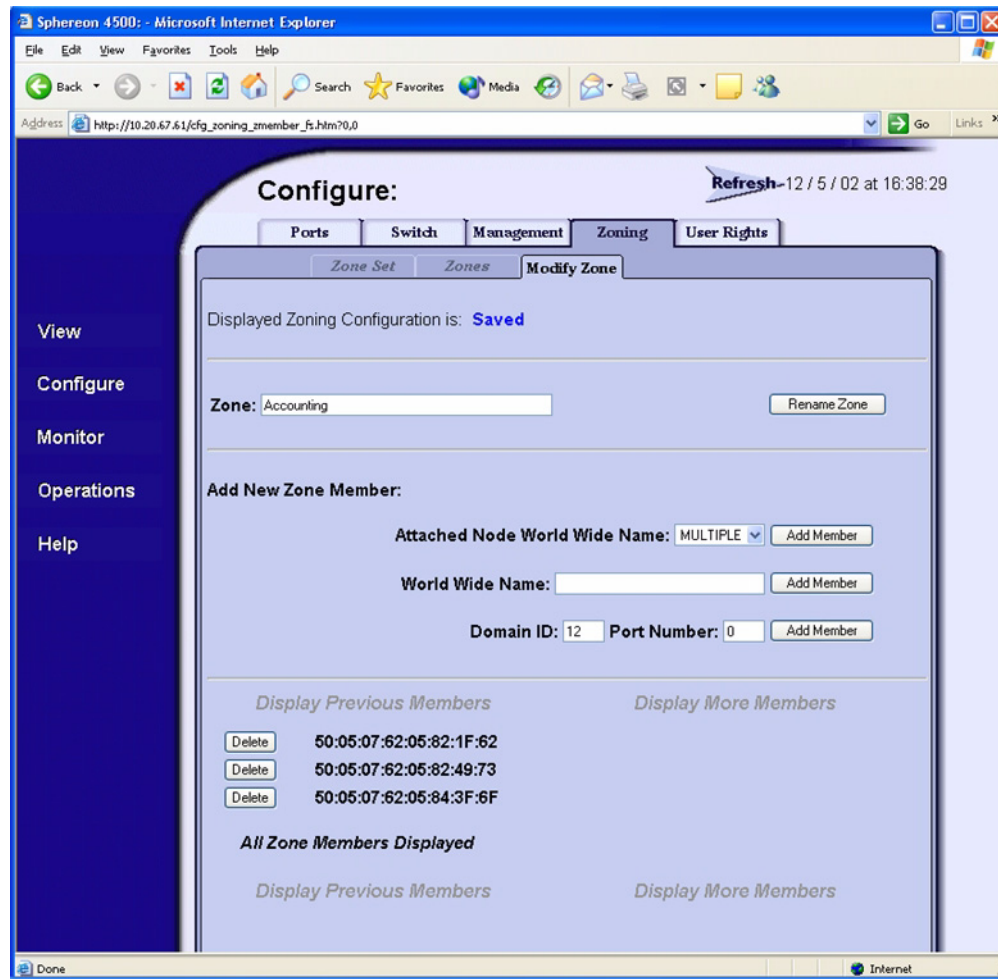
NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

McDATA Sphereon Web Management

1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **Zones** tab.



3. Select each zone and verify that all members are specified by WWN.



McDATA Telnet CLI

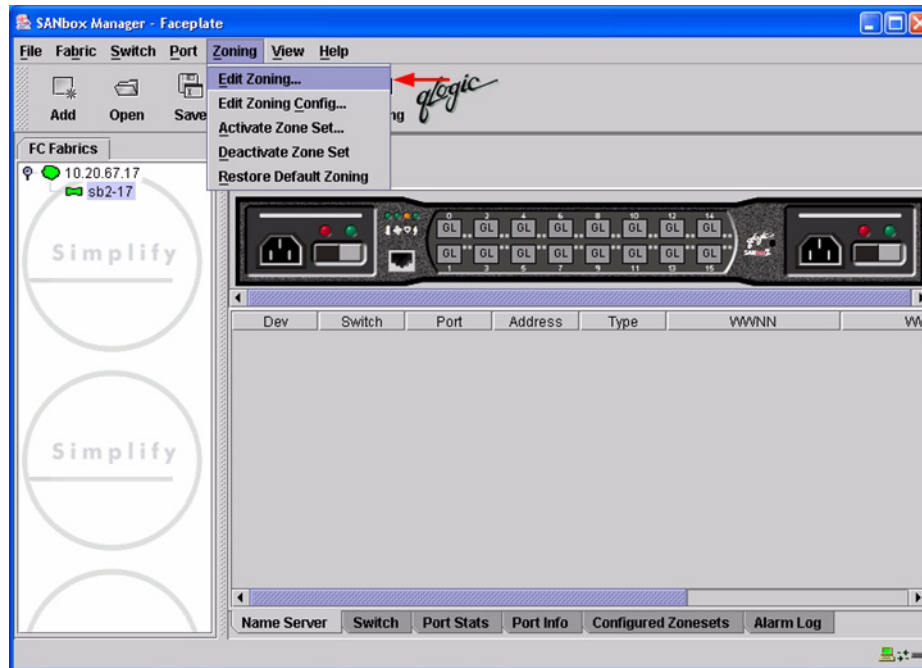
NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

```
Username: Administrator
Password: xxxxxxxxxx
Root> show
Show> zoning
```

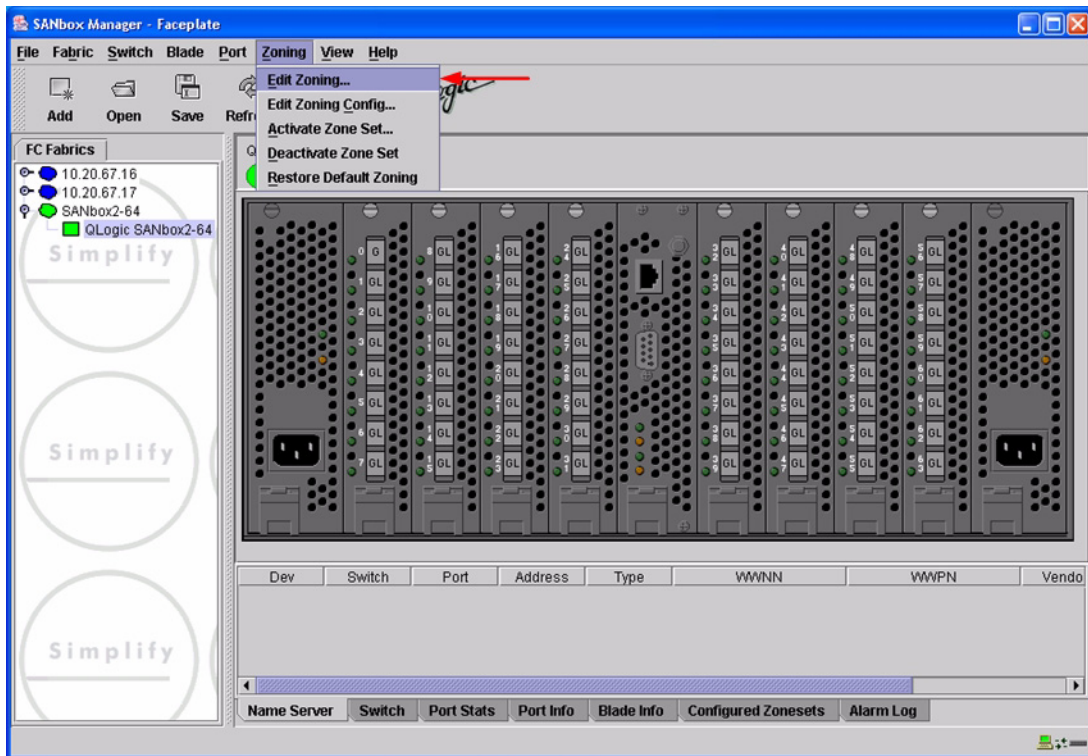
Verify that all of the Zone members are specified by WWN.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

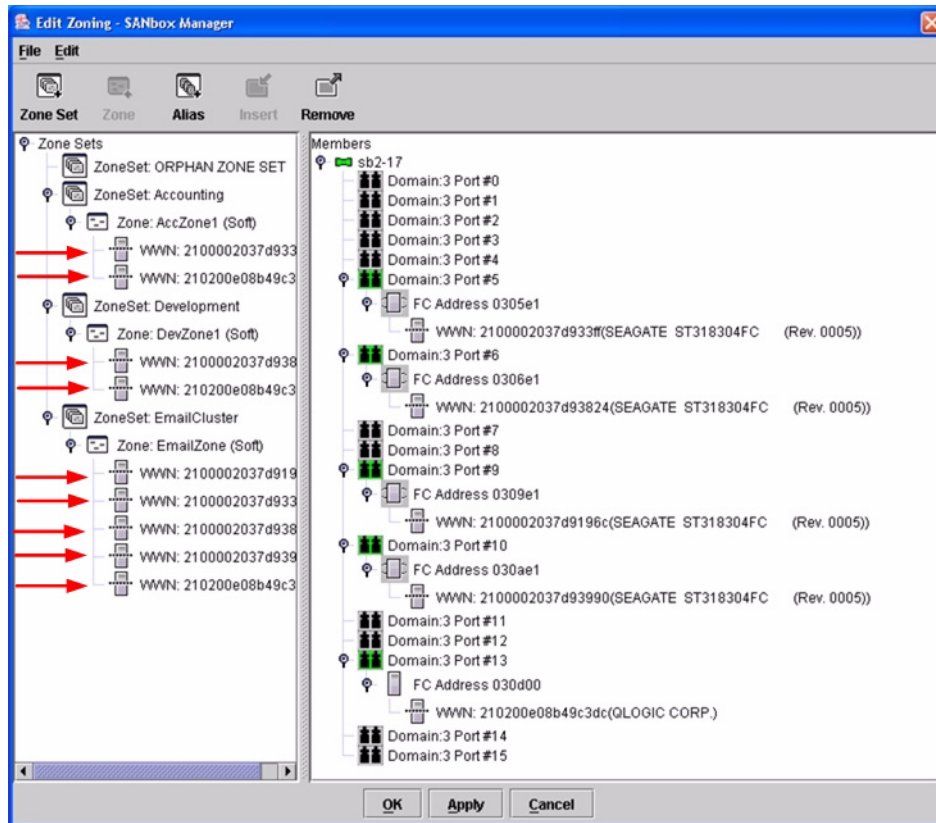


For the QLogic SANbox2-64, the following displays:

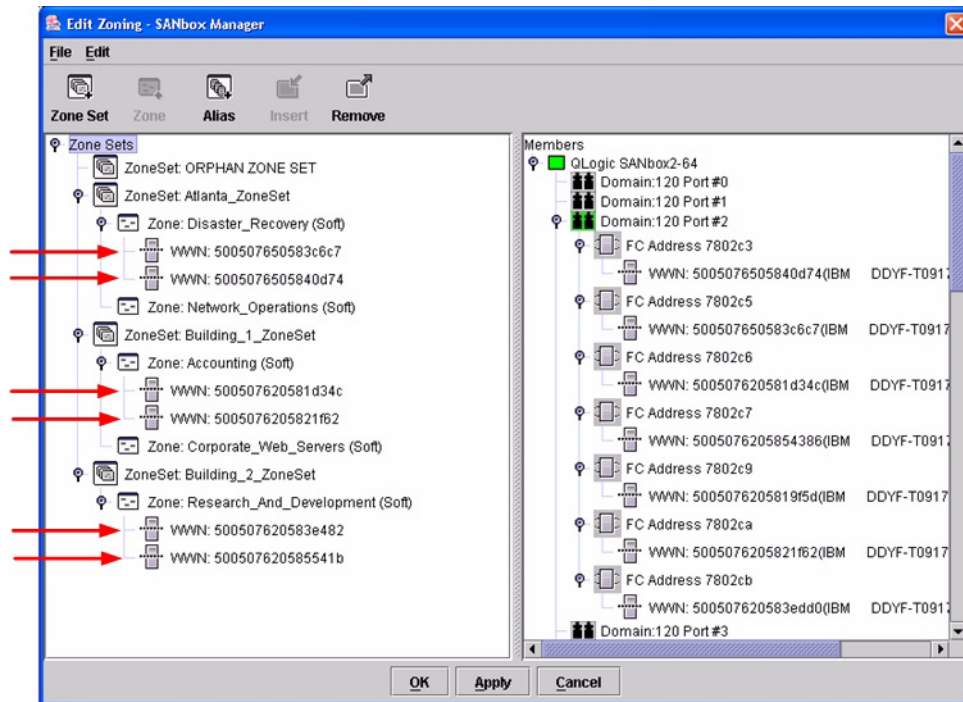


3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

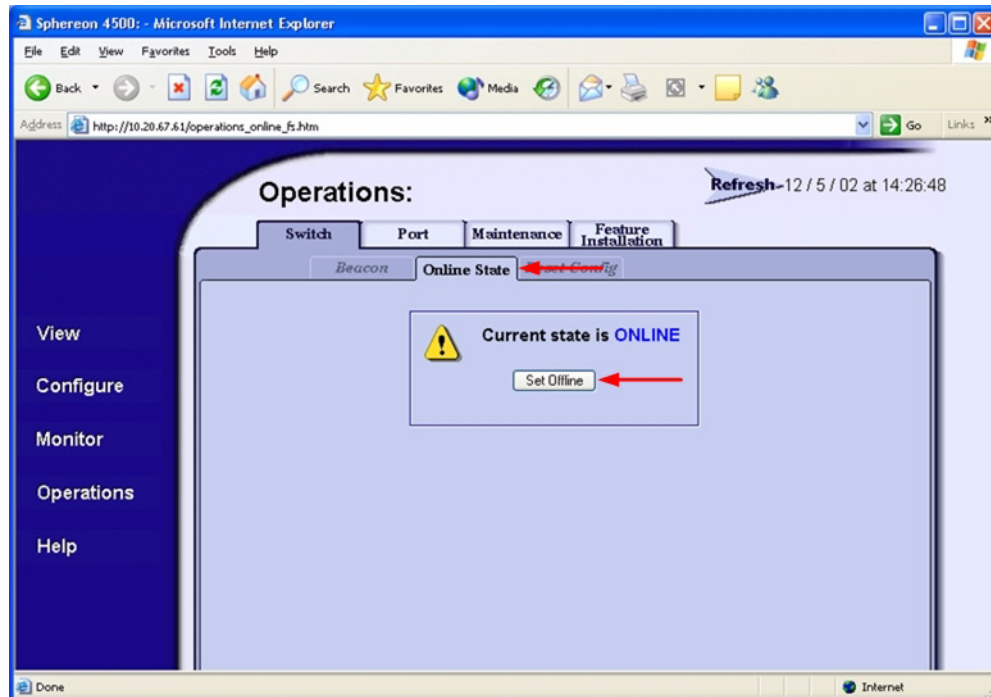
SANbox2#> **zone list <zone name>**

Confirm that only WWNs are listed.

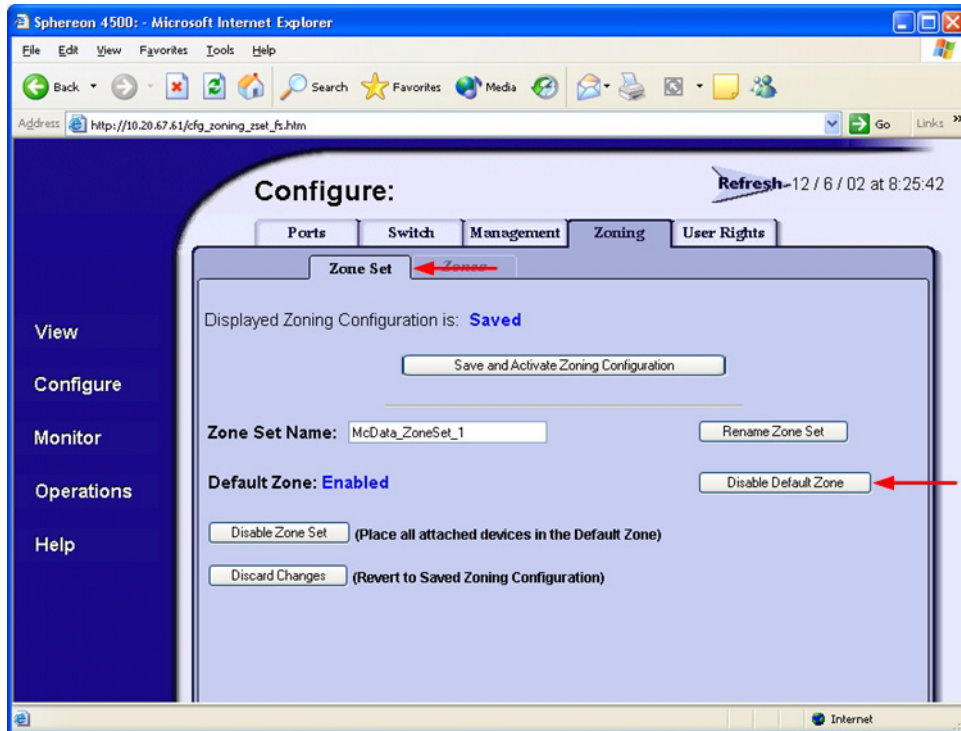
Operating Mode Configuration

McDATA Sphereon Web Management

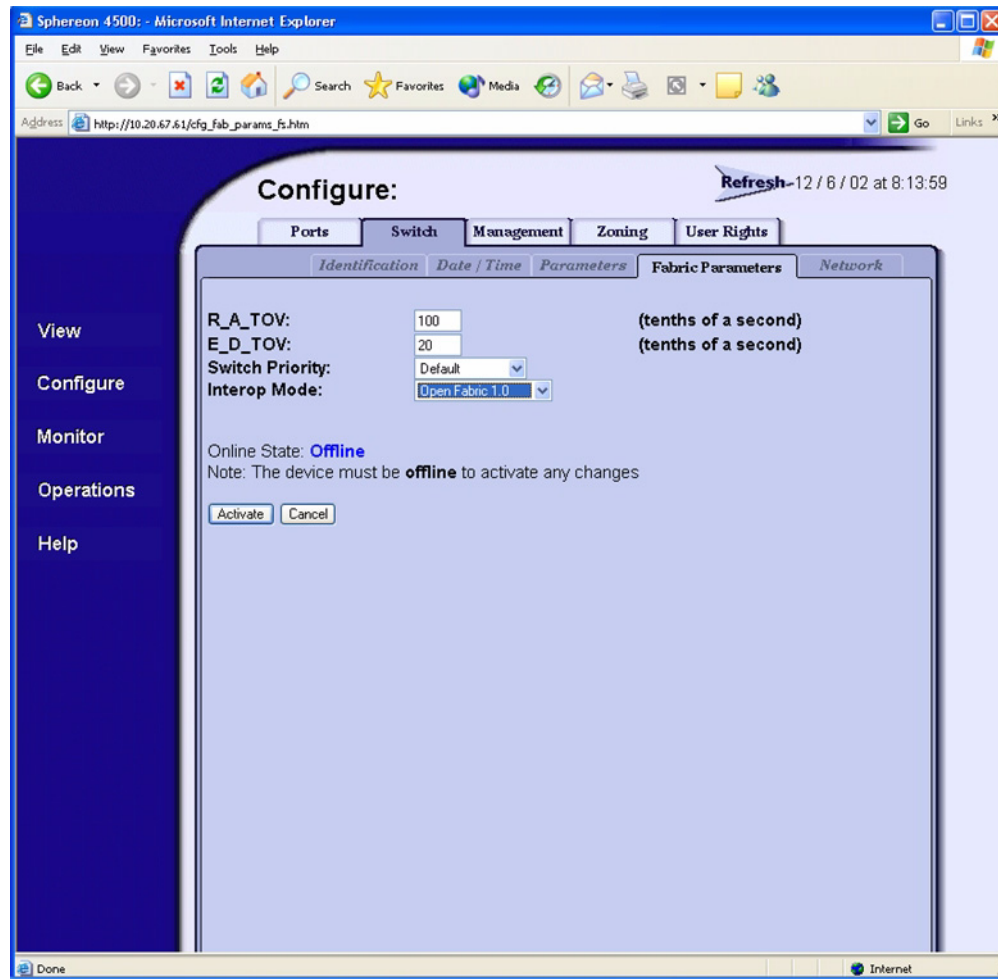
1. Start McDATA Sphereon Web Management. The **Main Switch View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select **Online State** tab, then click the **Set Offline** button.



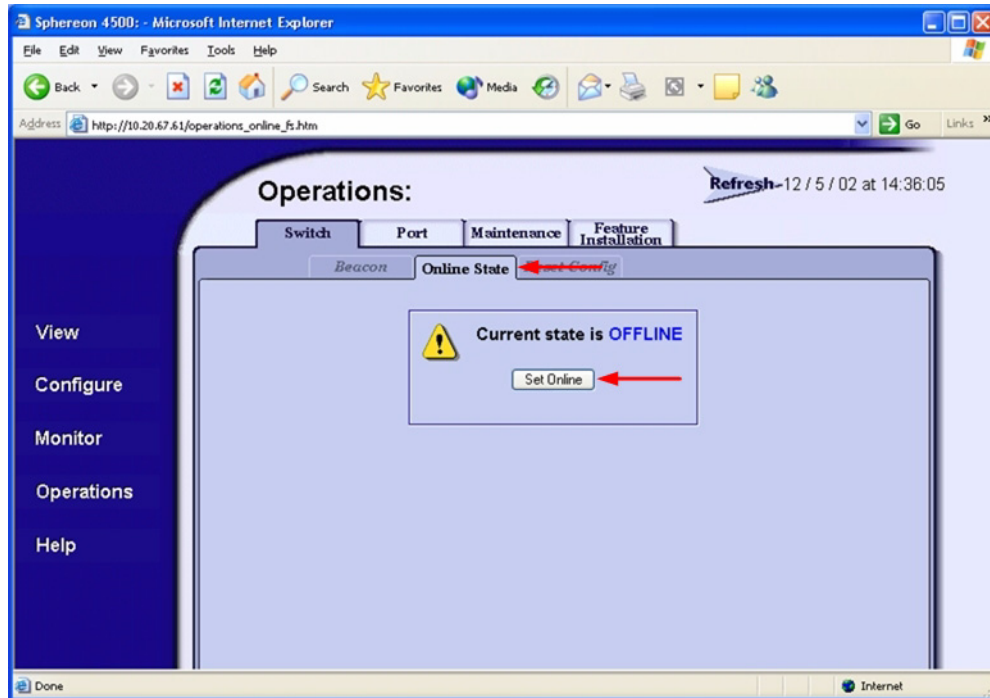
- On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, select the **Zone Set** tab, then the **Disable Default Zone** button.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Switch** tab, select the **Fabric Parameters** tab, then do the following:
 - a. From the **Interop Mode** list, select **Open Fabric 1.0**.
 - b. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Switch** tab, select **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> maint system
Maint.System> setOnlineState false
Maint.System> root
Root> config zoning
Config.Zoning> setDefZoneState false
Config.Zoning> root
Root> config switch
Config.Switch> interopMode open
Config.Switch> root
Root> maint system
Maint.System> setOnlineState true
```

QLogic SANbox Manager GUI

Not applicable.

QLogic CLI

Not applicable.

McDATA Specific Configuration

Not applicable.

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the McDATA and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

McDATA Intrepid 6000 Series Directors

Integration Checklist

The following steps must be completed to successfully merge McDATA and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches and Firmware Versions” on page 222](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration” on page 222](#)).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values” on page 231](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names” on page 240](#)).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types” on page 247](#)).
 - ✓ Ensure that all McDATA switches are configured for Open Fabric Interoperability mode (see [“Operating Mode Configuration” on page 254](#)).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist” on page 259](#)).

Configuration Limitations

When merging McDATA and QLogic fabrics, a maximum of 31 interconnected switches per fabric can be configured. Otherwise, all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from McDATA that comply with the FC-SW-2 standard.

QLogic and McDATA Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
McDATA	Intrepid 6064 Director	04.01.02.4 and above
	Intrepid 6140 Director	04.01.02.4 and above

Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the McDATA switch and the QLogic switch.

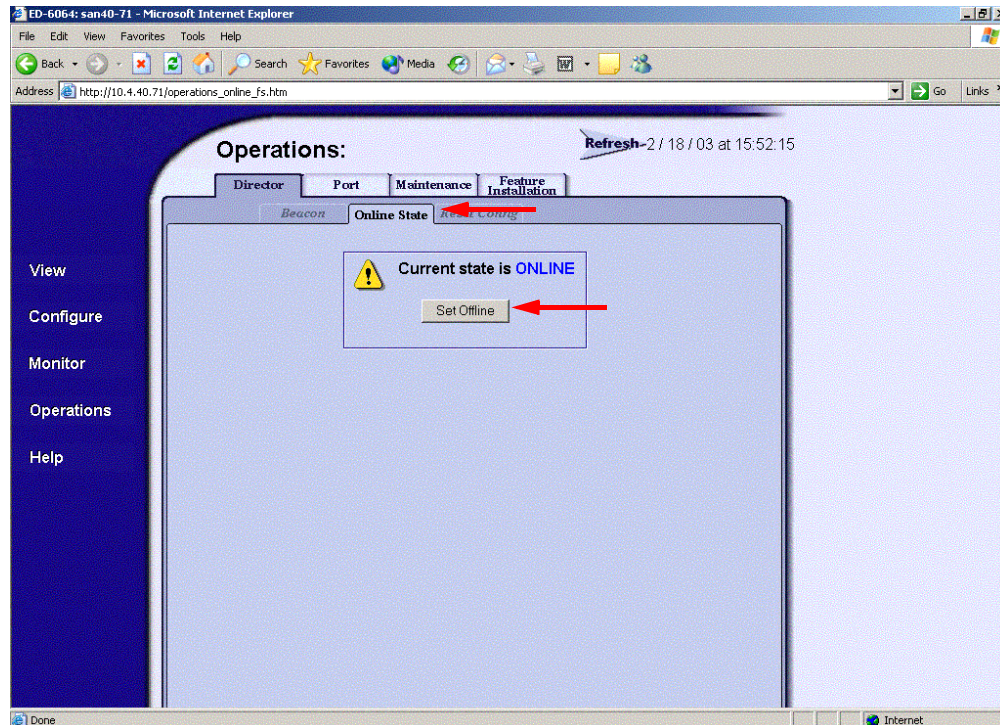
The Domain ID should be locked and unique within the 97–127 (0x61–0x7f) range. This is equivalent to 1–31 on the McDATA switch. The following chart lists the McDATA Domain ID and the corresponding QLogic Domain ID.

McDATA Versus QLogic Domain IDs

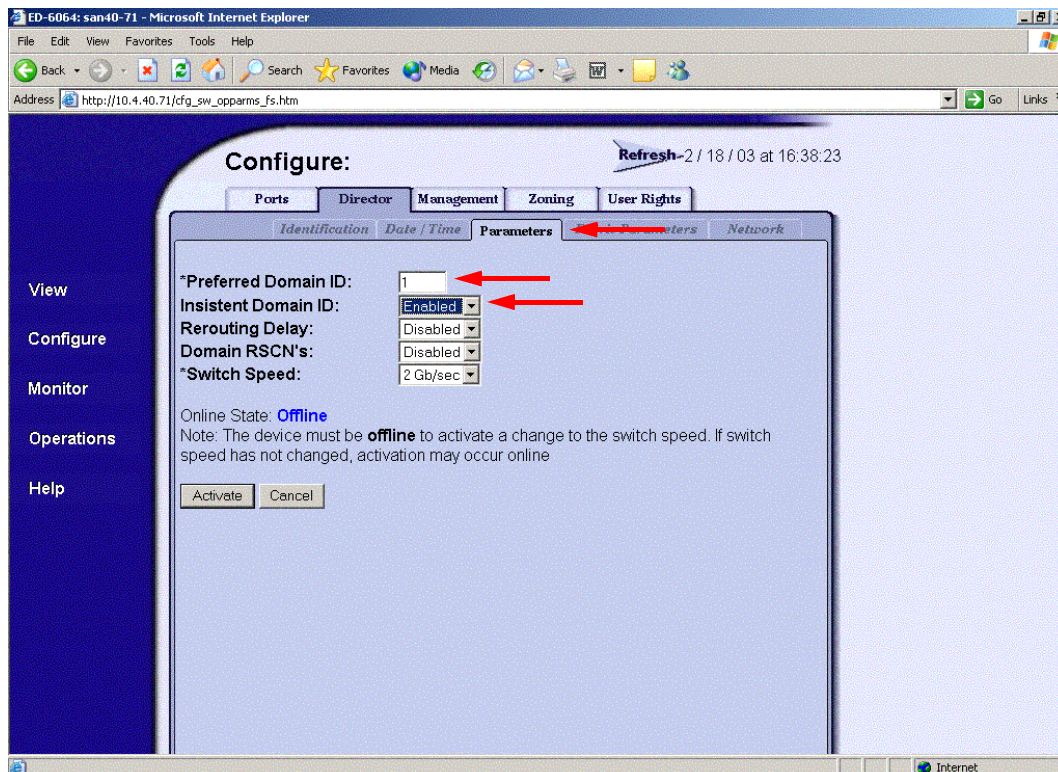
McDATA Domain ID	QLogic Domain ID	McDATA Domain ID	QLogic Domain ID	McDATA Domain ID	QLogic Domain ID
1	97	11	107	21	117
2	98	12	108	22	118
3	99	13	109	23	119
4	100	14	110	24	120
5	101	15	111	25	121
6	102	16	112	26	122
7	103	17	113	27	123
8	104	18	114	28	124
9	105	19	115	29	125
10	106	20	116	30	126
—	—	—	—	31	127

McDATA SANpilot Web Management

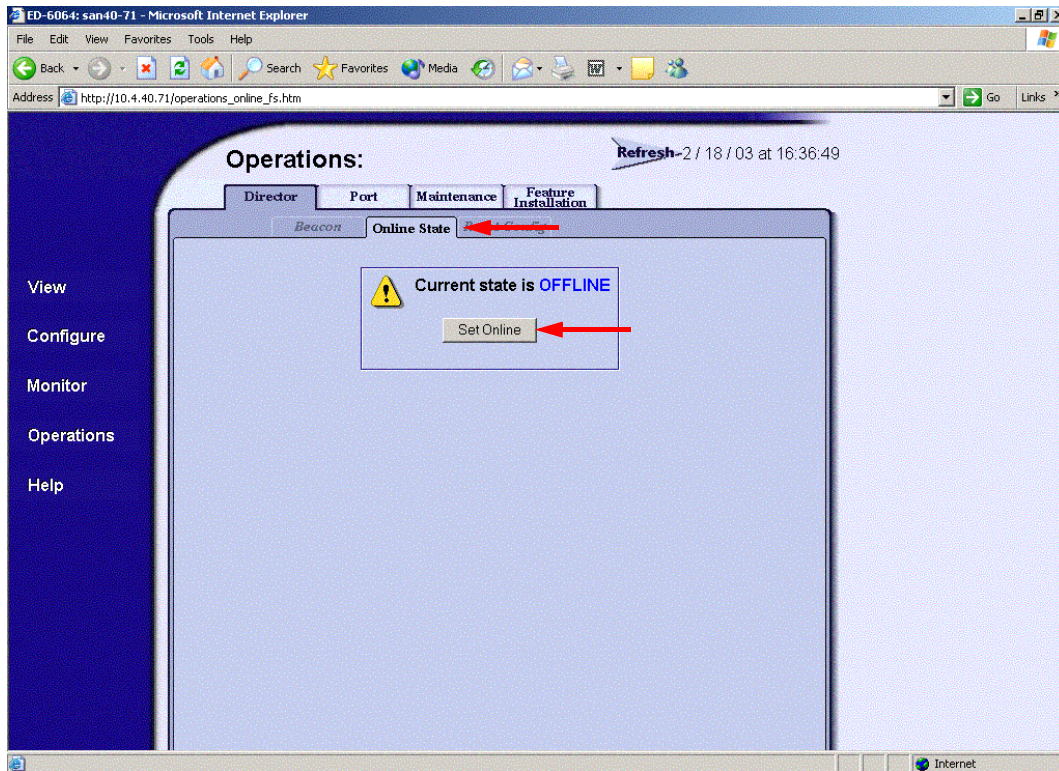
1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Offline** button.



3. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, select the **Parameters** tab, and do the following:
 - a. In the **Preferred Domain ID** box, type a unique Domain ID.
 - b. From the **Insistent Domain ID** list, select **Enabled**.
 - c. Click **Activate**.



4. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA SANpilot Web Management is not available.

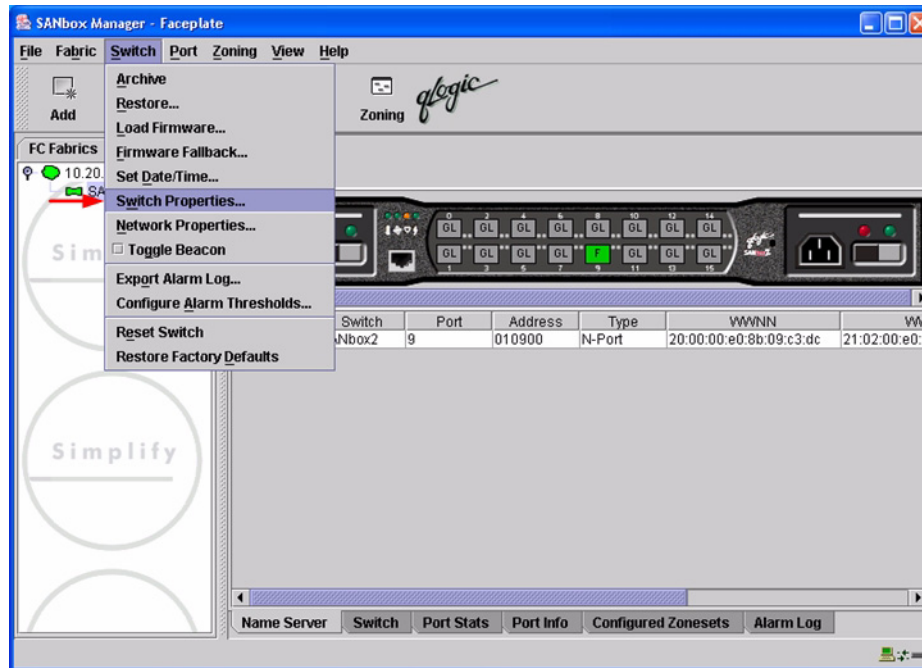
```
Username: Administrator
Password: xxxxxxxx
Root> maint system
Maint.System> setOnlineState False
Maint.System> root
Root> config switch
Config.Switch> prefDomainId 1
Config.Switch> insistDomainId enable
Config.Switch> show

Switch Information
BB Credit:                16
R_A_TOV:                   100
E_D_TOV:                   20
Preferred Domain ID:      1
Switch Priority:           Default
Speed:                     2 Gb/sec
Rerouting Delay:          Disabled
Interop Mode:              Open Fabric 1.0
Insistent Domain ID:      Enabled
Domain RSCN:               Disabled

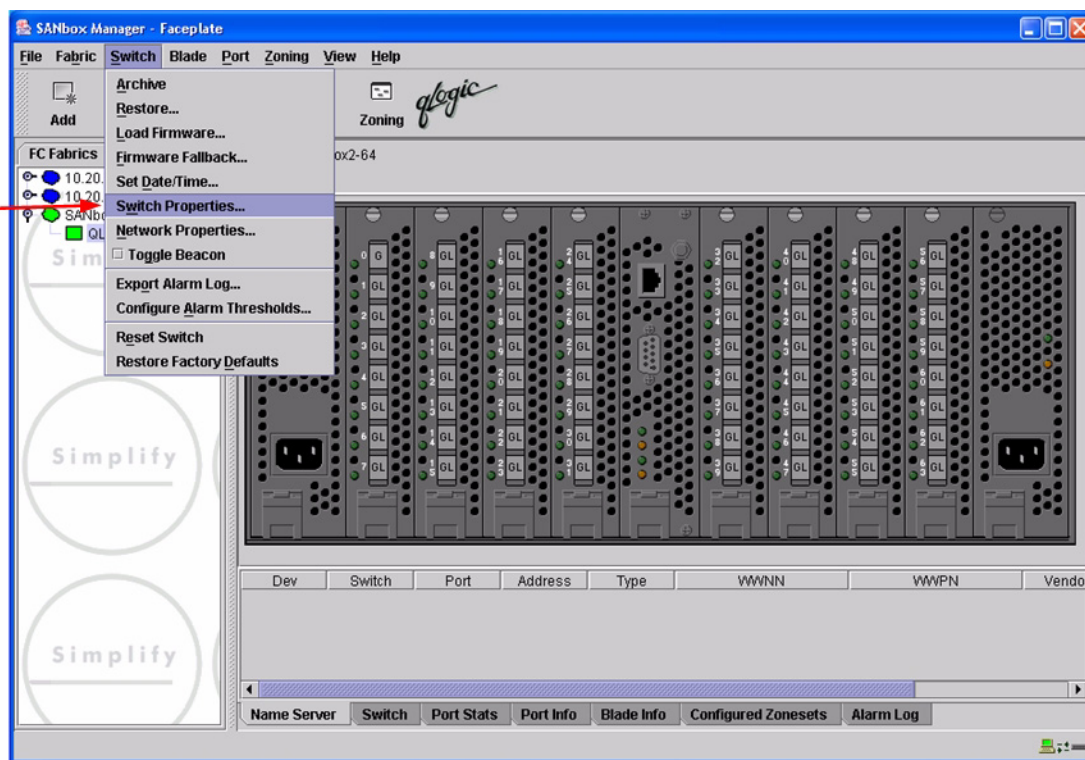
Config.Switch> root
Root> maint system
Maint.System> setOnlineState True
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19	FC Address: 010000
Operational State: online	Firmware Version: V1.3-56-0
Chassis Name: SANbox2	MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16	

Chassis Name: <input type="text" value="SANbox2"/> Administrative State: <input type="text" value="online"/> Domain ID: <input type="text" value="1"/> Domain ID lock: <input checked="" type="radio"/> Enable <input type="radio"/> Disable Broadcast Support: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Timeout Values R_A_TOV: <input type="text" value="10000"/> R_T_TOV: <input type="text" value="100"/> E_D_TOV: <input type="text" value="2000"/>
--	--

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb	FC Address: 780000
Operational State: online	Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64	MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1	

Chassis Name: <input type="text" value="QLogic SANbox2-64"/> Administrative State: <input type="text" value="online"/> Domain ID: <input type="text" value="120"/> Domain ID lock: <input checked="" type="radio"/> Enable <input type="radio"/> Disable Broadcast Support: <input checked="" type="radio"/> Enable <input type="radio"/> Disable In-band Management: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	Timeout Values R_A_TOV: <input type="text" value="10000"/> R_T_TOV: <input type="text" value="100"/> E_D_TOV: <input type="text" value="2000"/>
--	--

OK Close

Qlogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1] <choose a unique number>
DomainIDLock (True / False) [False] True
SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [10000]
E_D_TOV (decimal value, 10-20000 msec) [2000]
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]
SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate
The configuration will be activated. Please confirm (y/n): [n] y
```


Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

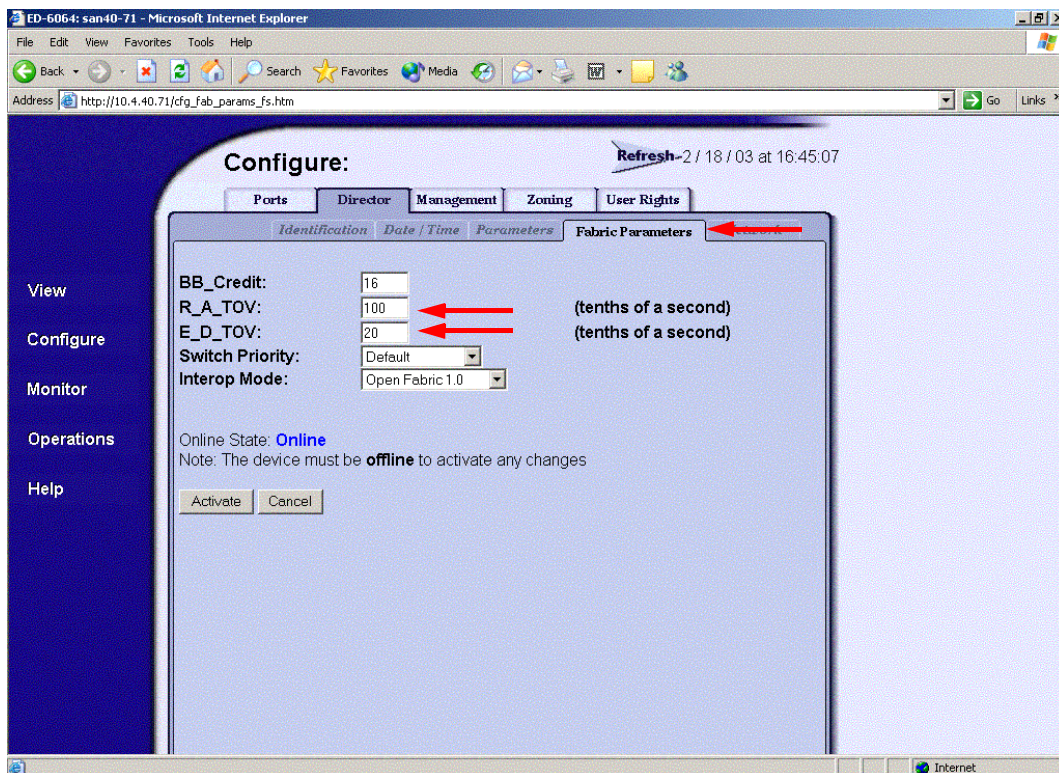
R_A_TOV = 10 seconds

E_D_TOV = 2 seconds

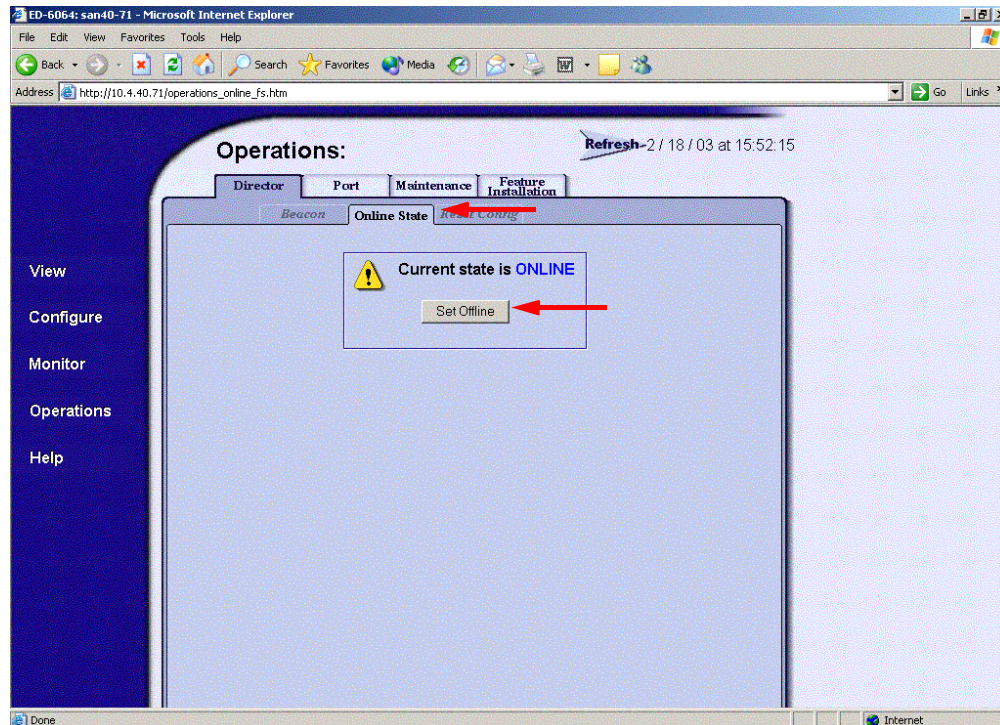
This section provides the steps to change these values.

McDATA SANpilot Web Management

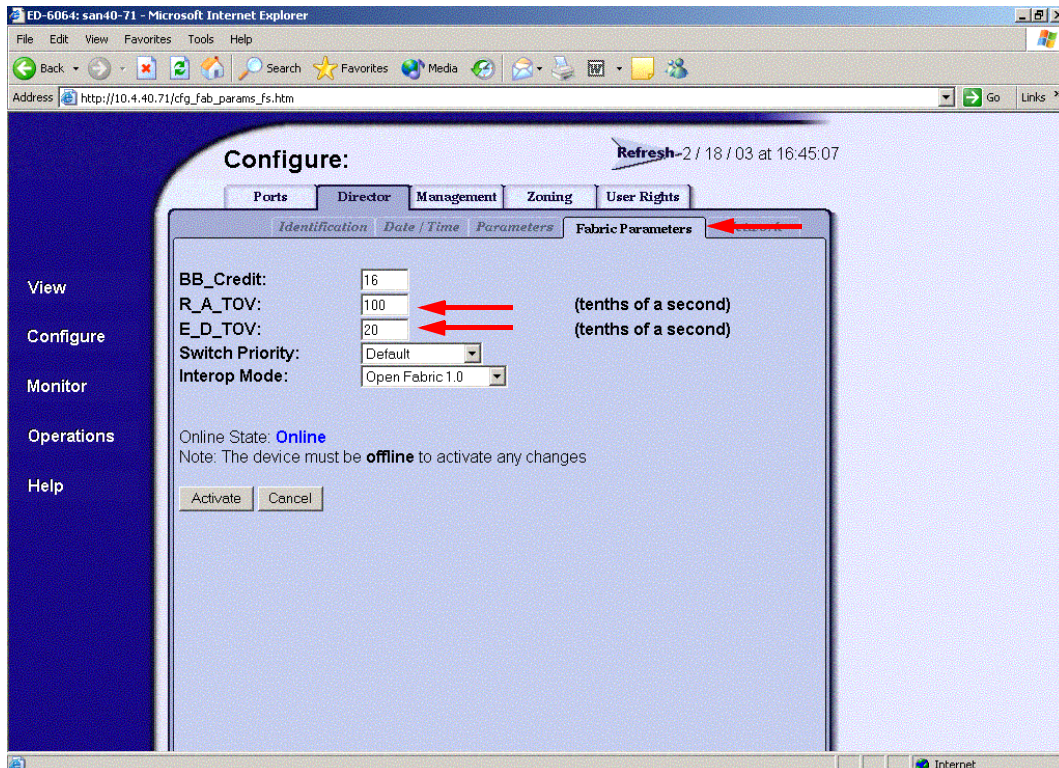
1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, then select the **Fabric Parameters** tab. Verify that **R_A_TOV** is set to **100** and **E_D_TOV** is set to **20**. If the settings are not correct, proceed to [step 3](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.



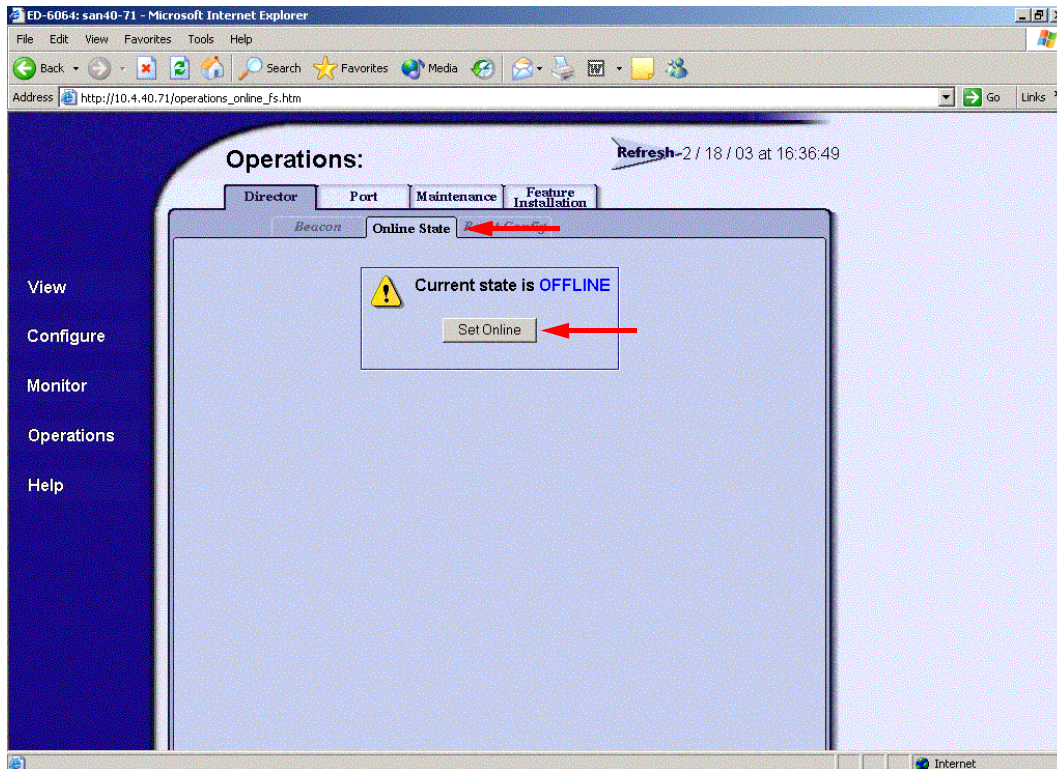
3. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select **Online State** tab, then click the **Set Offline** button.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, select the **Fabric Parameters** tab, then do the following:
 - a. In the **R_A_TOV** box, change the setting to **100**.
 - b. In the **E_D_TOV** box, change the setting to **20**.
 - c. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA SANpilot Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> main system

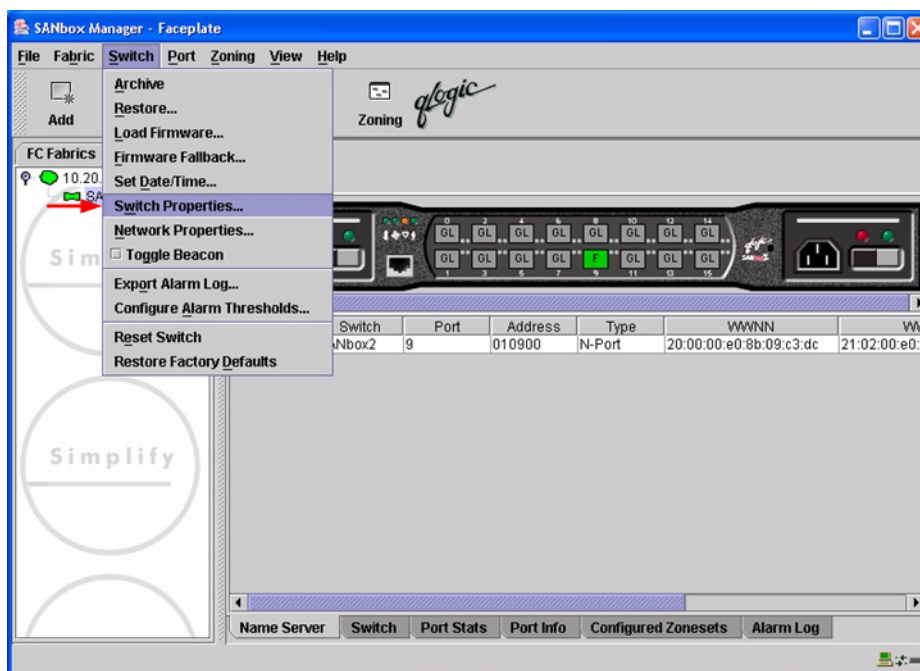
Maint.System> setOnlineState False
Maint.System> root
Root> config switch
Config.Switch> raTOV 100
Config.Switch> edTOV 20
Config.Switch> show

Switch Information
BB Credit:                16
R_A_TOV:                   100
E_D_TOV:                   20
Preferred Domain ID:      1
Switch Priority:           Default
Speed:                     2 Gb/sec
Rerouting Delay:          Disabled
Interop Mode:              Open Fabric 1.0
Insistent Domain ID:      Enabled
Domain RSCN:               Disabled
Root> maint system
Maint.System> setOnlineState True
```

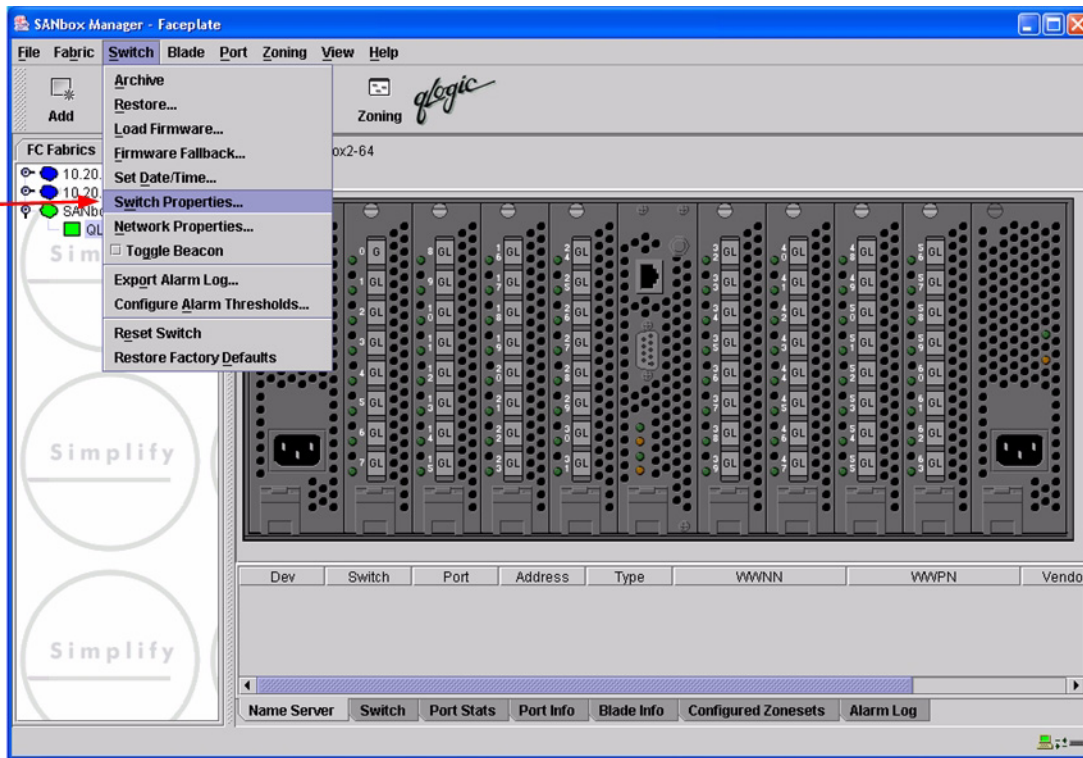
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
 2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
- For the QLogic SANbox2-8 and SANbox2-16, the following displays:

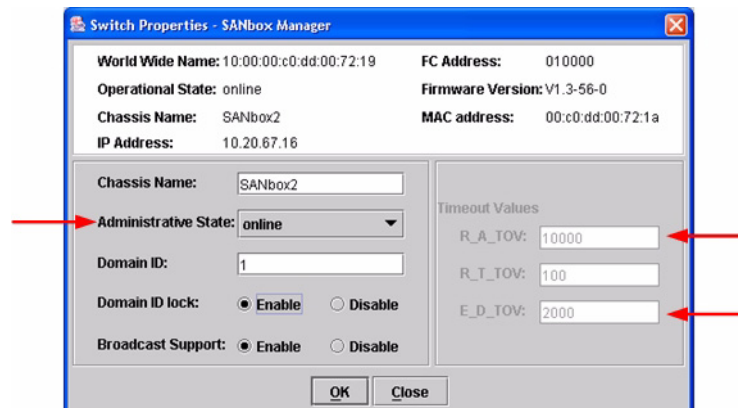


For the QLogic SANbox2-64, the following displays:

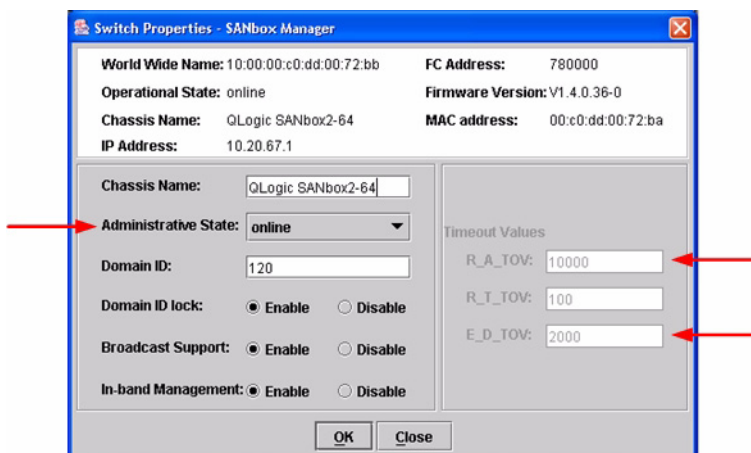


- From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

Brocade switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

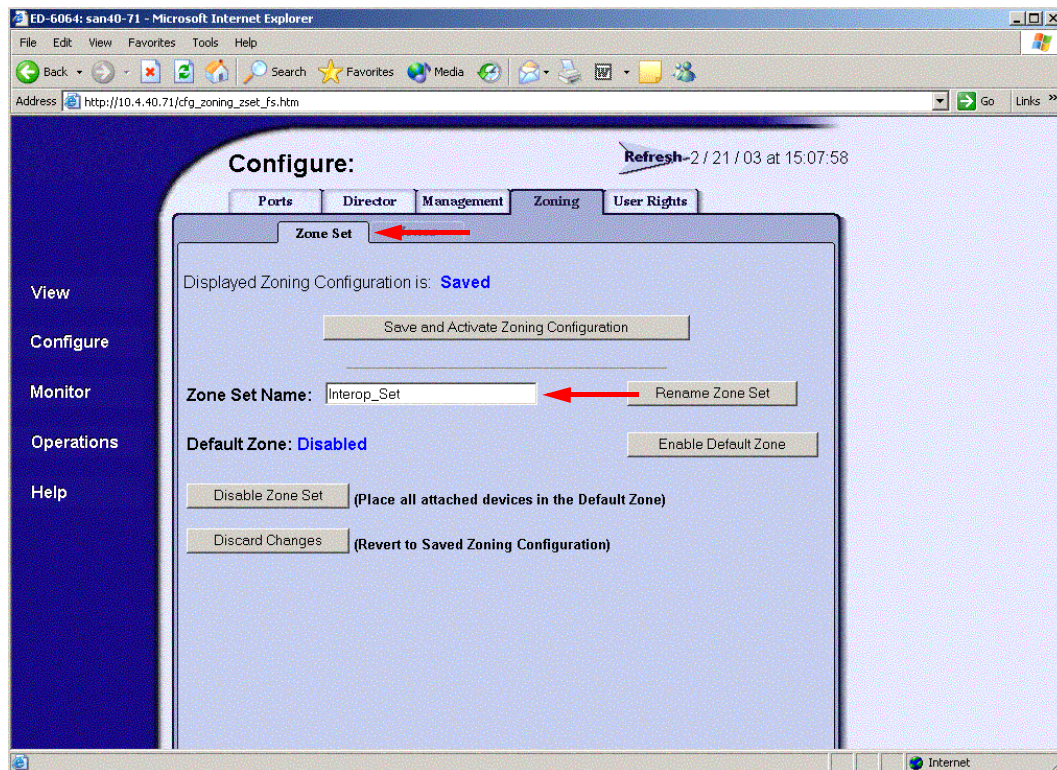
Active Zone Set Names

The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

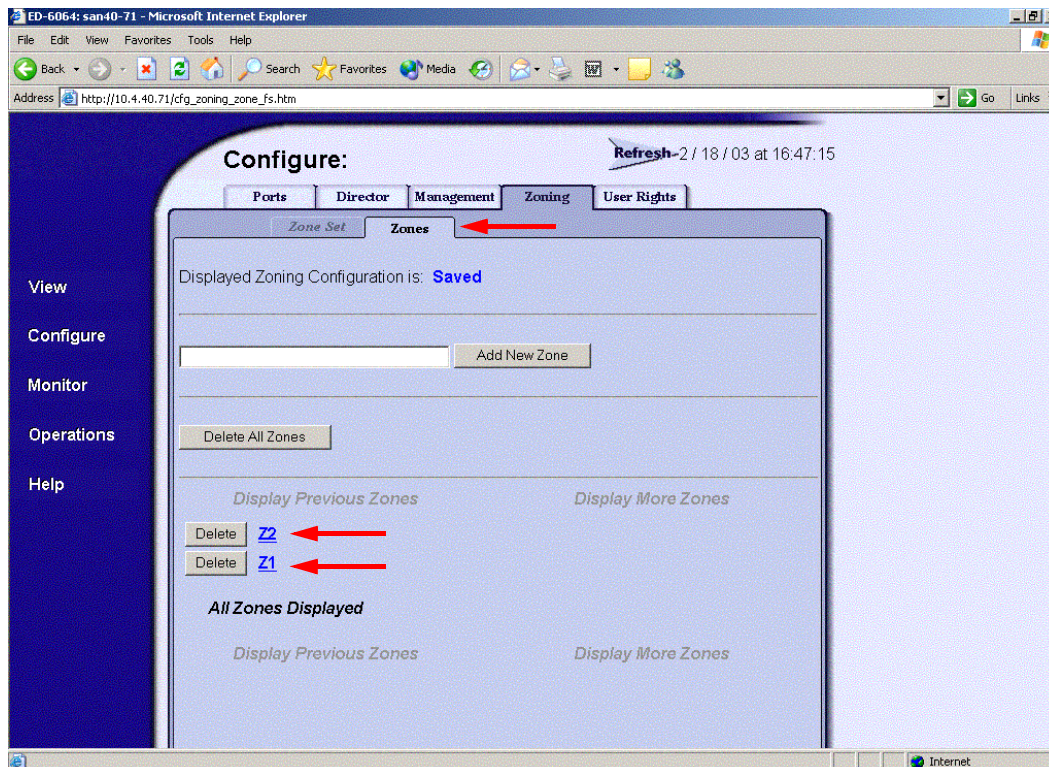
1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

McDATA SANpilot Web Management

1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **ZoneSet** tab. Verify that the Zone Set name conforms to the standards for zone naming as discussed under “[Active Zone Set Names](#)” on page 240.



- On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **Zones** tab. Verify that the Zone names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 240.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA SANpilot Web Management is not available.

Username: **Administrator**

Password: **xxxxxxxx**

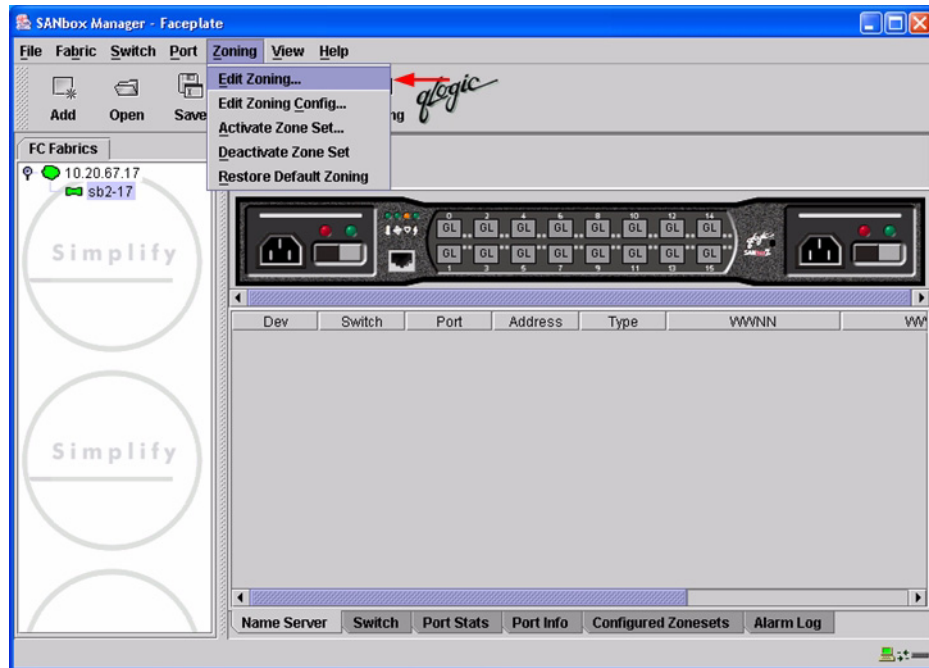
Root> **show**

Show> **zoning**

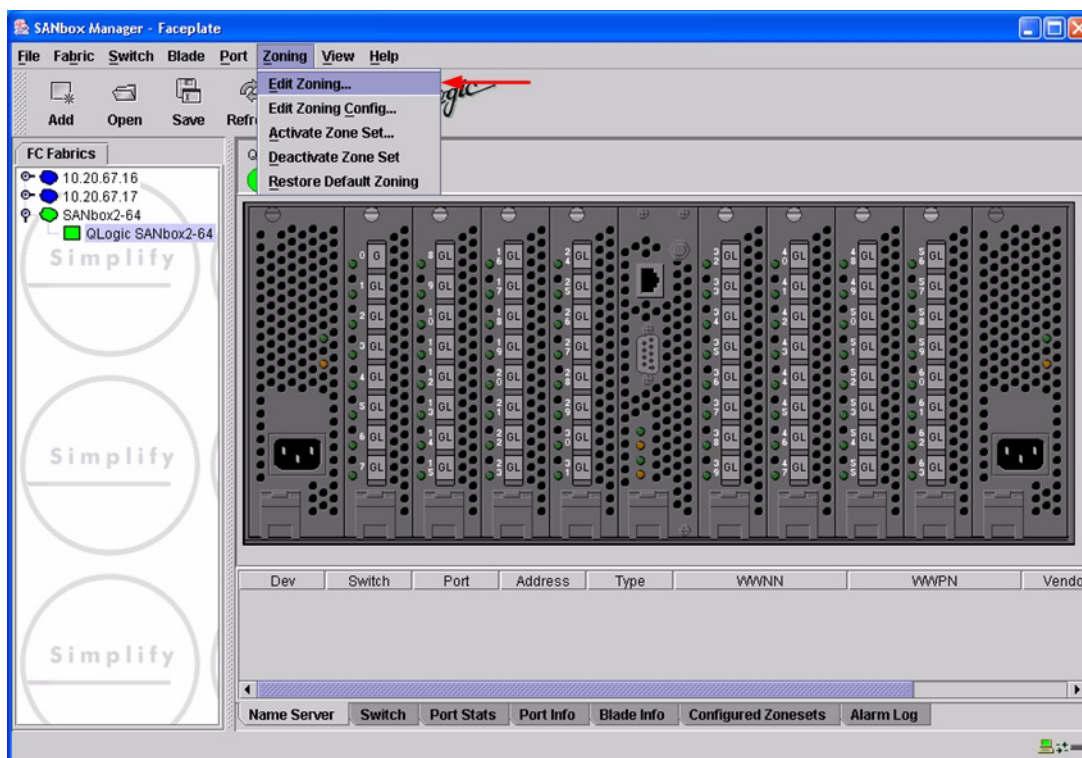
Verify that the Zone Set and Zone Names conform to the standards for zone naming as discussed under “Active Zone Set Names” on page 240.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

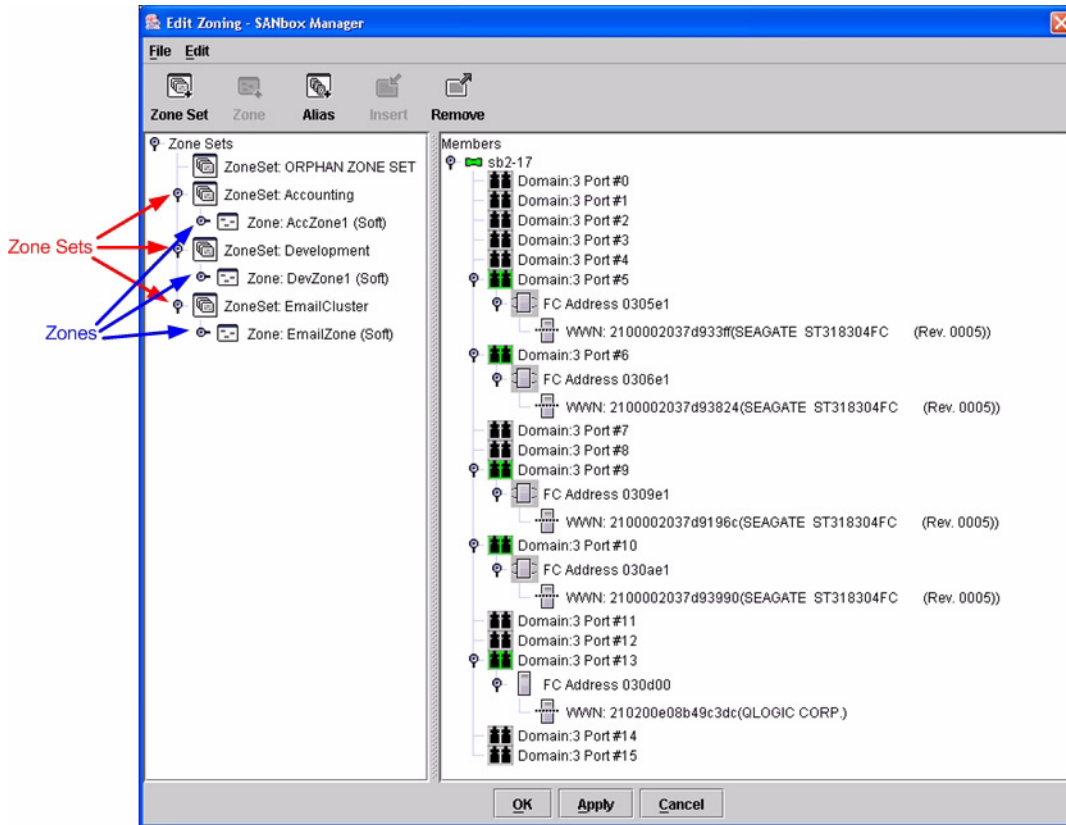


For the QLogic SANbox2-64, the following displays:

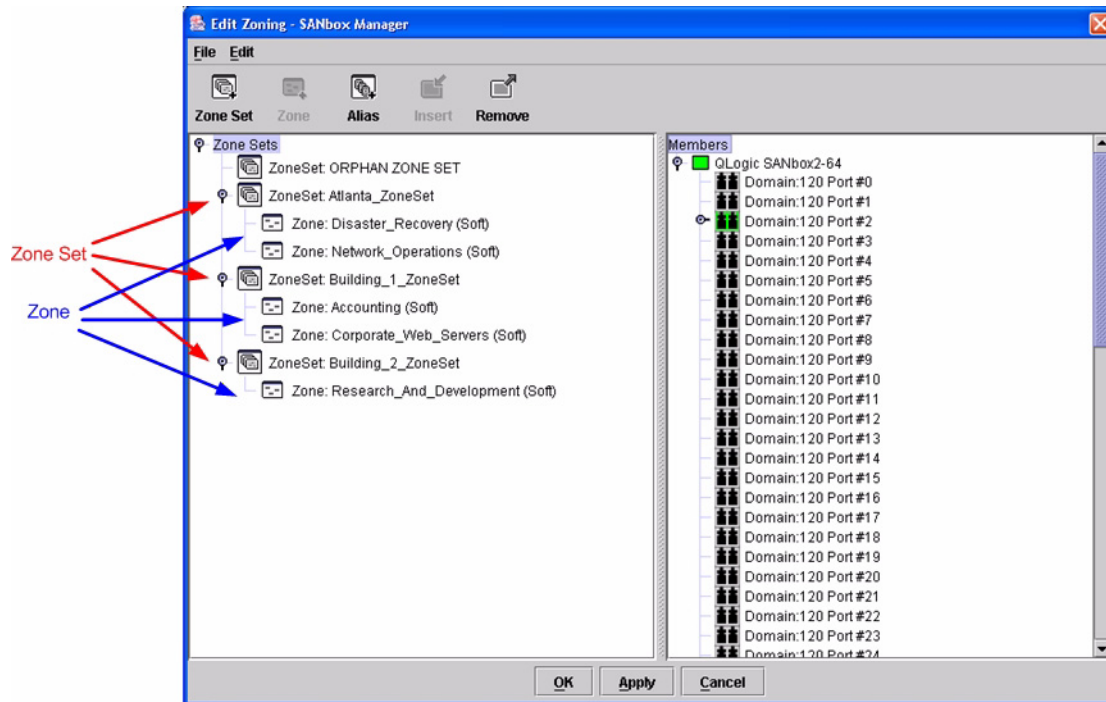


- From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 240.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

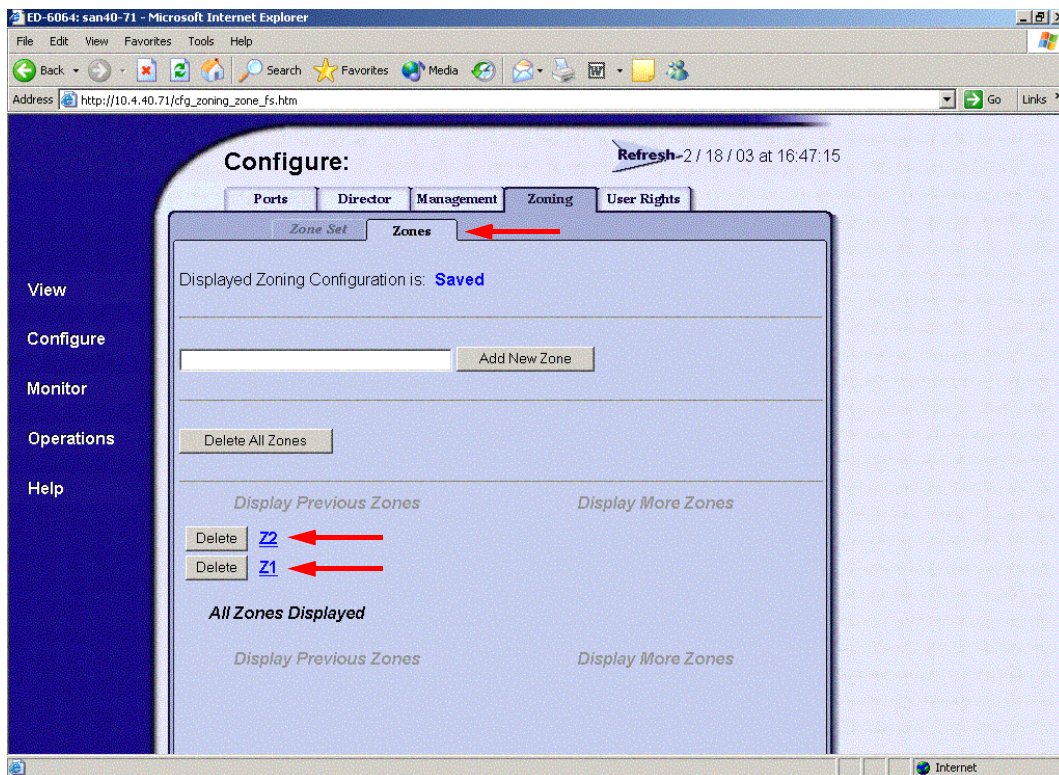
SANbox2 #> **zone list**

Zone Types

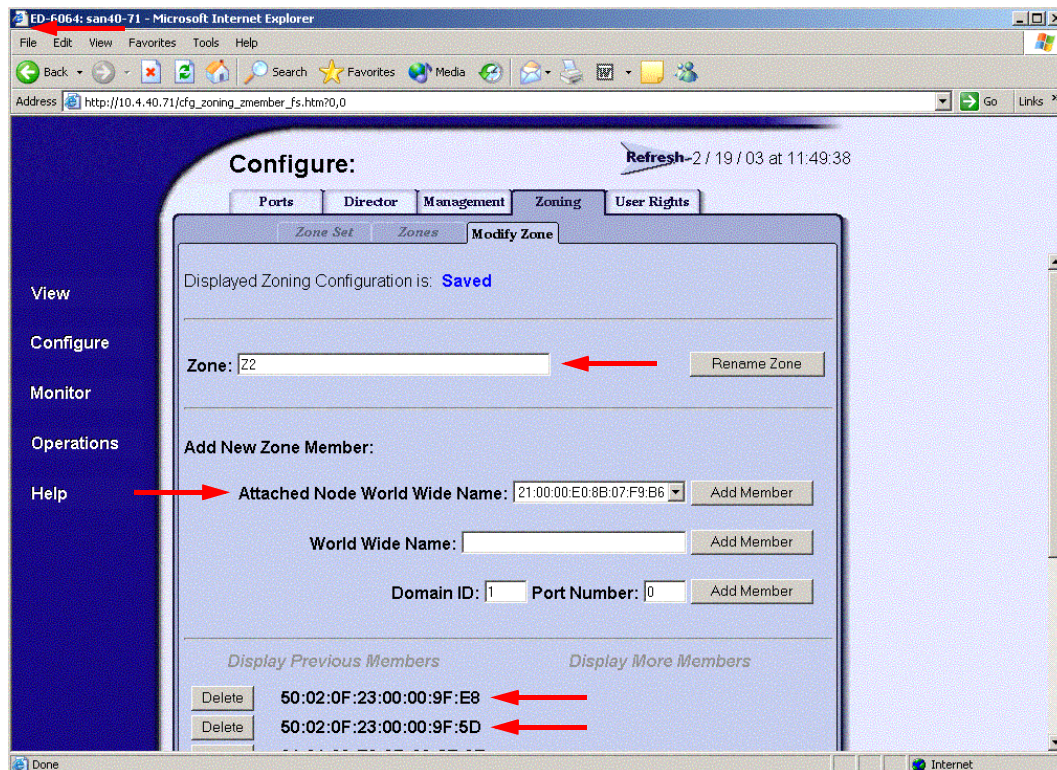
All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, then select the **Zones** tab. Select each zone.



- For each the zone selected in [step 2](#), verify that all members are specified by WWN.



McDATA Telnet CLI

NOTE: **NOTE:** Use the following CLI commands when McDATA SANpilot Web Management is not available.

Username: **Administrator**

Password: **xxxxxxxx**

Verify that all of the Zone members are specified by WWN.

```
Root> show
```

```
Show> zoning
```

```
Active Zone Set
```

```
Default Zone Enabled:      False
```

```
Zone Set:  Interop_Set
```

```
Zone:  Z2
```

```
Zone Member:  50:02:0F:23:00:00:9F:E8
```

```
Zone Member:  50:02:0F:23:00:00:9F:5D
```

```
Zone Member:  21:01:00:E0:8B:22:6E:2E
```

```
Zone Member:  21:00:00:E0:8B:09:CA:63
```

```
Zone Member:  21:00:00:E0:8B:09:8F:5E
```

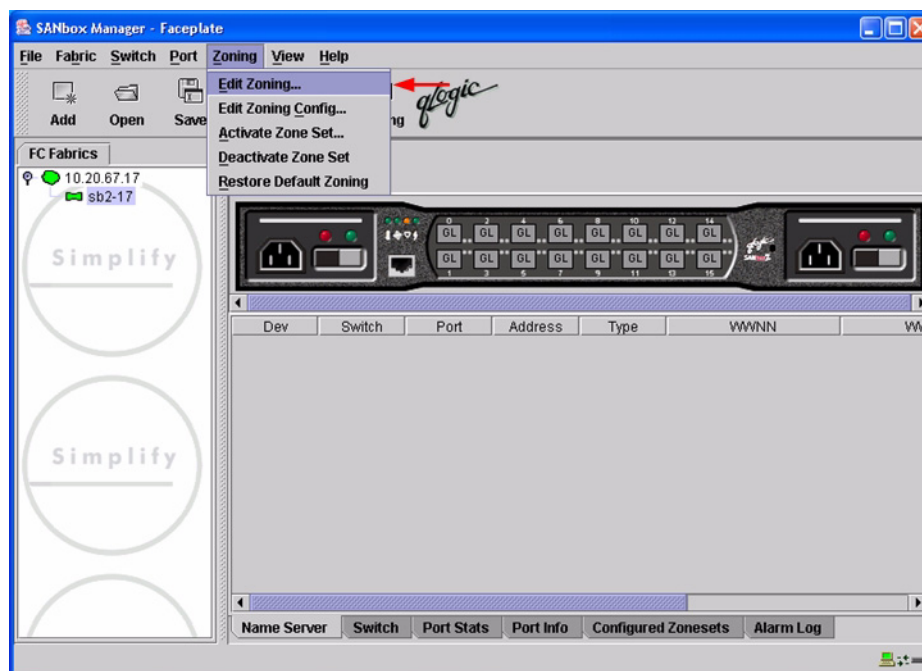
```
Zone Member:  21:00:00:E0:8B:07:4C:B7
```

```
Zone Member:  21:00:00:E0:8B:06:8E:67
```

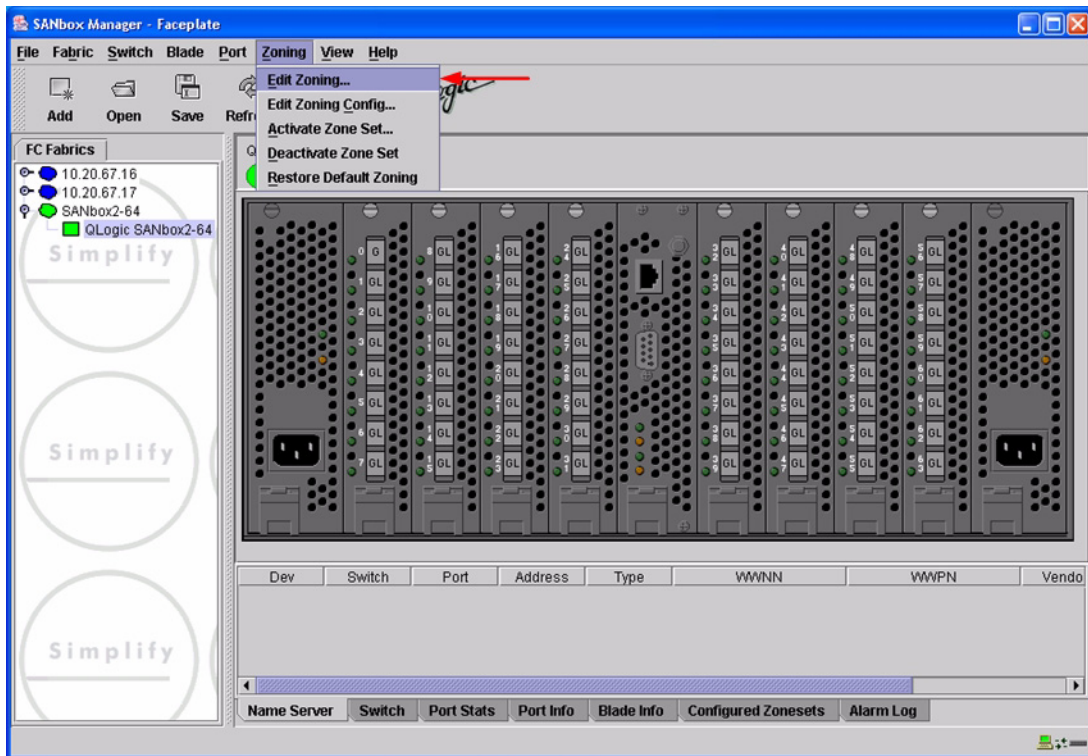
```
Zone Member:  21:00:00:E0:8B:06:8A:67
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

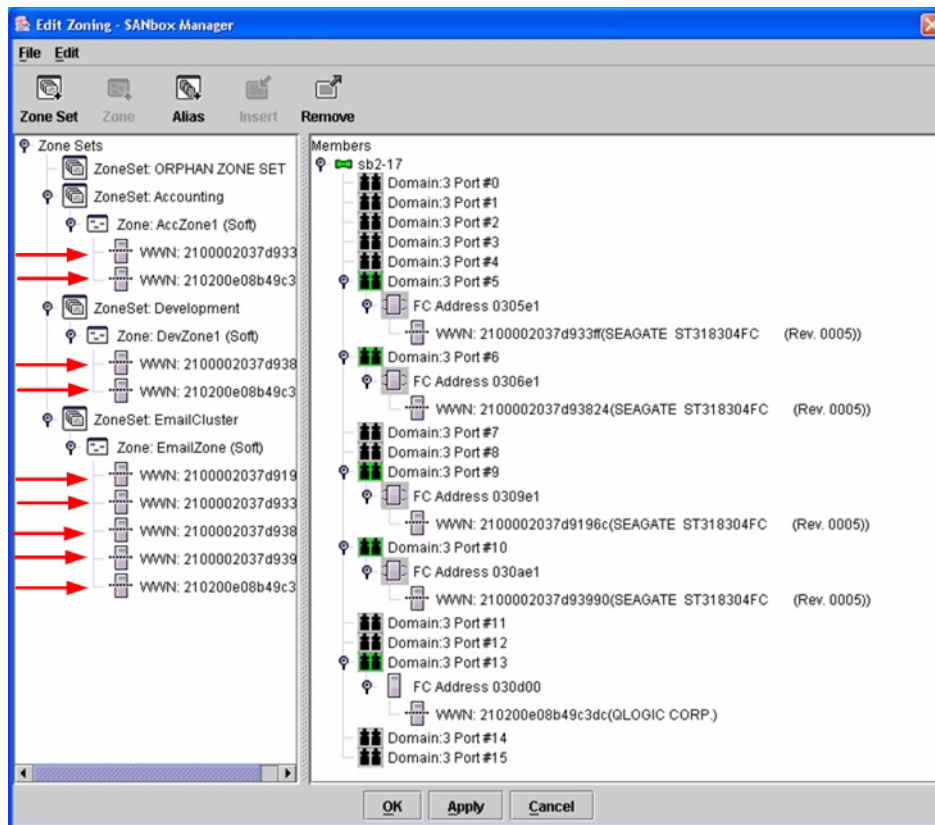


For the QLogic SANbox2-64, the following displays:

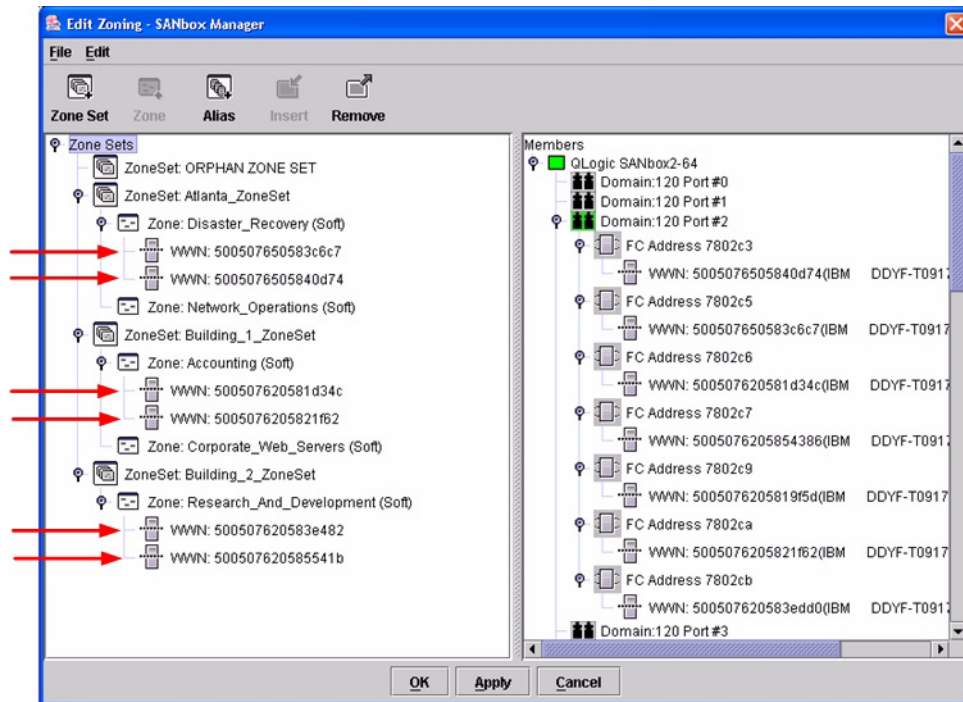


3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

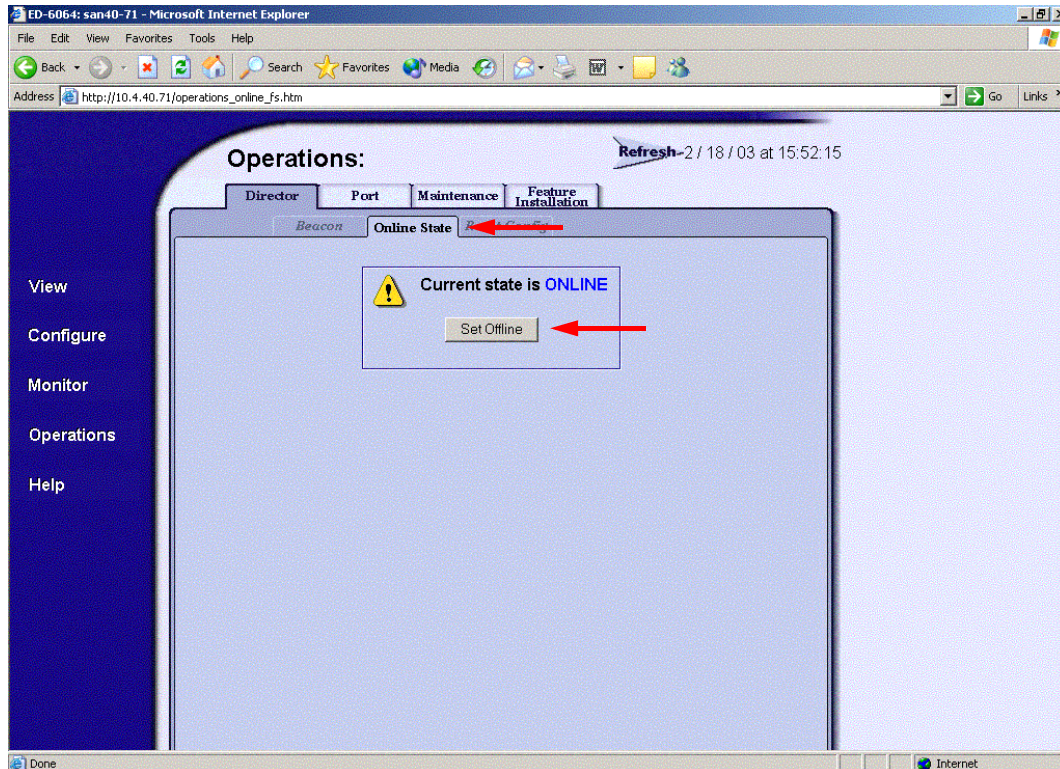
SANbox2#> **zone list <zone name>**

Confirm that only WWNs are listed.

Operating Mode Configuration

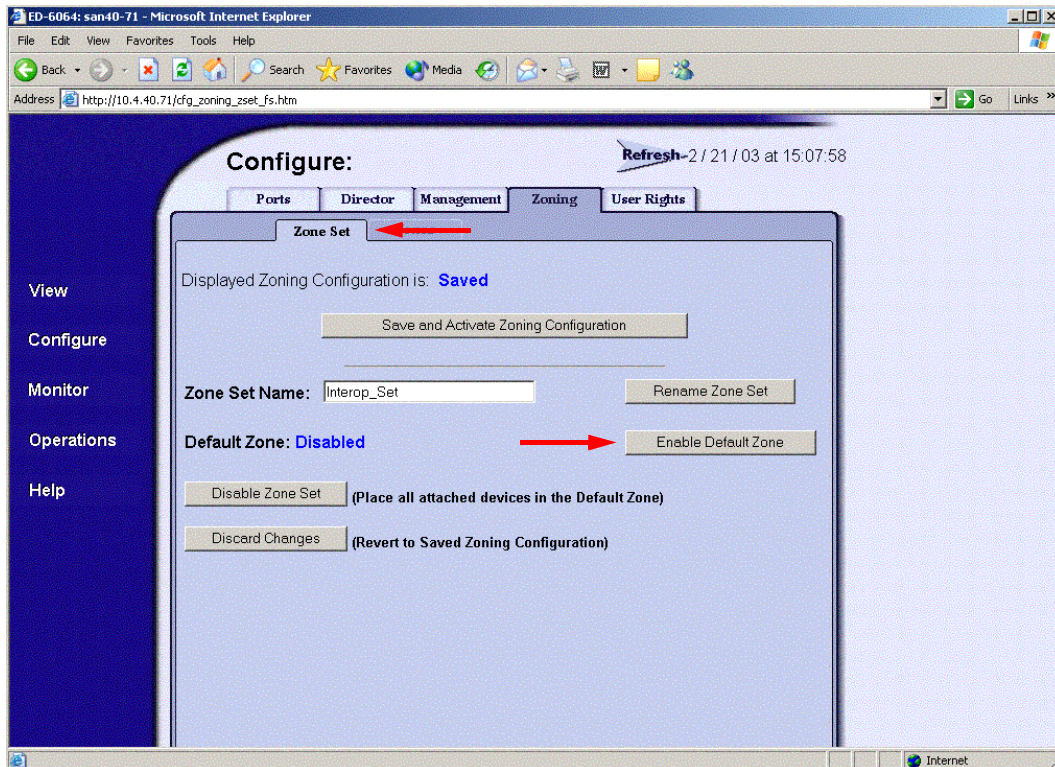
McDATA SANpilot Web Management

1. Start McDATA SANpilot Web Management. The **Main Director View** dialog box displays.
2. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Offline** button.

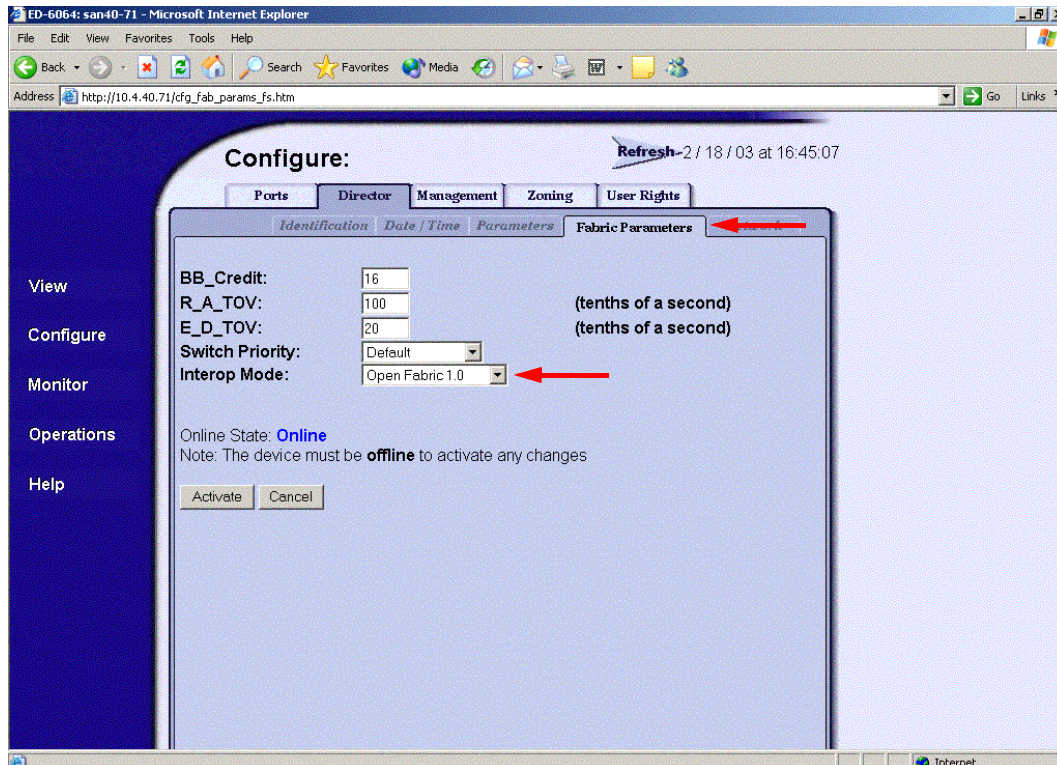


- On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Zoning** tab, select the **Zone Set** tab, then the **Disable Default Zone** button.

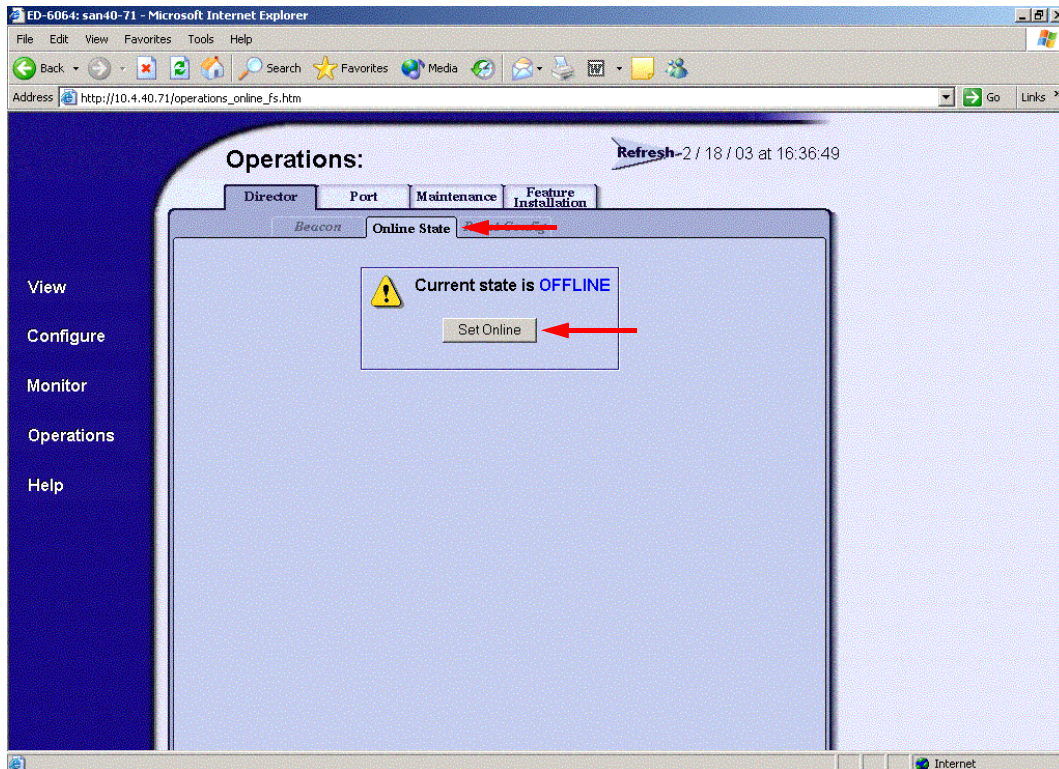
NOTE: The figure below shows what displays when the **Disable Default Zone** button is selected.



4. On the navigation panel, select **Configure**. The **Configure** dialog box displays. Select the **Director** tab, select the **Fabric Parameters** tab, then do the following:
 - a. From the **Interop Mode** list, select **Open Fabric 1.0**.
 - b. Click **Activate**.



5. On the navigation panel, select **Operations**. The **Operations** dialog box displays. Select the **Director** tab, select the **Online State** tab, then click the **Set Online** button.



McDATA Telnet CLI

NOTE: Use the following CLI commands when McDATA Sphereon Web Management is not available.

```
Username: Administrator
Password: xxxxxxxx
Root> maint system
Maint.System> setOnlineState False
Maint.System> root
Root> config zoning
Config.Zoning> setDefZoneState False
Config.Zoning> root
Root> config switch
Config.Switch> interopMode Open
Config.Switch> root
Root> maint system
Maint.System> setOnlineState True
```

QLogic SANbox Manager GUI

Not applicable.

QLogic CLI

Not applicable.

McDATA Specific Configuration

Not applicable.

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the McDATA and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

Merging QLogic and Sun Fabrics

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from Sun that comply with the FC-SW-2 standard.

QLogic and Sun Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8	1.3.x and above
	SANbox2-16	1.3.x and above
	SANbox2-64	1.5.x and above
Sun	Sun StorEdge Network 2 Gb FC Switch-8	1.3.x and above
	Sun StorEdge Network 2 Gb FC Switch-16	1.3.x and above

Sun StorEdge Network 2 Gb FC Series Switches ([see page 263](#)) provides detailed information about merging QLogic and Sun fabrics.

Sun StorEdge Network 2 Gb FC Series Switches

Integration Checklist

The following steps must be completed to successfully merge Sun and QLogic fabrics. The remainder of this section provides detailed instructions and examples.

ATTENTION!!

- Backup the current configuration prior to performing the following steps so that the configuration is available if something goes wrong.
 - Disruptions in the fabric can occur as a result of performing the following steps. Therefore, it is recommended that these changes be done during down time or off-peak hours.
-
- ✓ Verify that the correct version of switch firmware is installed on each switch (see [“Supported Switches and Firmware Versions” on page 264](#)).
 - ✓ Ensure that each switch has a unique Domain ID and that it falls within the proper range (see [“Domain ID Configuration” on page 265](#)).
 - ✓ Set all switches to the appropriate timeout values (see [“Timeout Values” on page 272](#)).
 - ✓ Ensure that all Zone set and Zone names are unique and conform to ANSI T11 standards (see [“Active Zone Set Names” on page 279](#)).
 - ✓ Ensure that all zone members are specified by WWPN (see [“Zone Types” on page 286](#)).
 - ✓ Verify that the fabrics have successfully merged (see [“Successful Integration Checklist” on page 292](#)).

Configuration Limitations

The following QLogic software features are not supported in Sun fabrics.

- Virtual Private Fabric (VPF) Zoning
- Access Control List (ACL) Zoning
- I/O PathGuard
- I/O StreamGuard

No limitations exist when merging Sun and QLogic fabrics; all features are fully supported and comply with industry standards.

Supported Switches and Firmware Versions

The following QLogic switches have been tested in the QLogic environment and comply with the FC-SW-2 standard. QLogic switches have tested interoperable with the following switches from Sun that comply with the FC-SW-2 standard.

QLogic and Sun Supported Switch and Firmware Versions

Manufacturer	Switch Model	Firmware Version
QLogic	SANbox2-8 Switch	1.3.x and above
	SANbox2-16 Switch	1.3.x and above
	SANbox2-64 Switch	1.5.x and above
Sun	Sun StorEdge Network 2 Gb FC Switch-8	1.3.x and above
	Sun StorEdge Network 2 Gb FC Switch-16	1.3.x and above

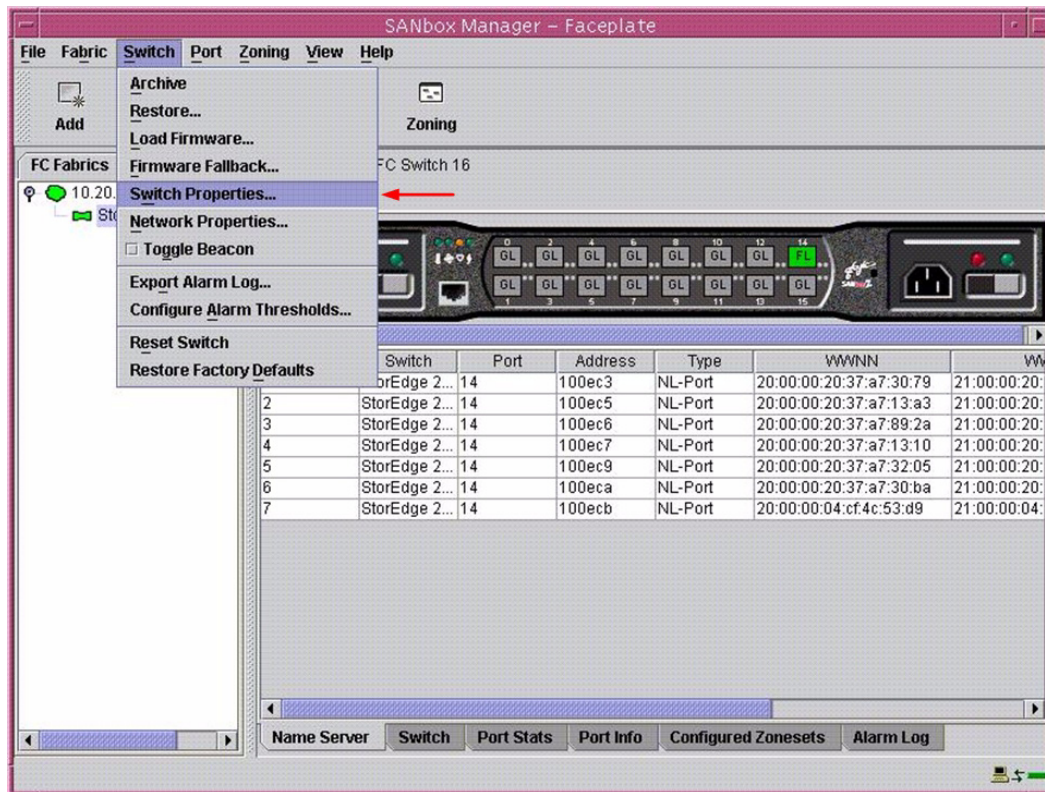
Domain ID Configuration

To ensure that there are no conflicts between switches, we recommend that each switch have an assigned Domain ID. The following steps show how to set the Domain ID on both the Sun switch and the QLogic switch.

Sun StorEdge SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:

Switch Properties – SANbox Manager

World wide name: 10:00:00:c0:dd:00:72:19	FC address: 100000
Operational state: online	Firmware version: V1.4.2.3-0
Chassis name: StorEdge 2Gb FC Switch 16	MAC address: 00:c0:dd:00:72:1a
IP address: 10.20.67.16	

Chassis name: StorEdge 2Gb FC Switch 16	Timeout values R_A_TOV: 10000 R_T_TOV: 100 E_D_TOV: 2000
Administrative state: online	
Domain ID: 16	
Domain ID lock: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
Broadcast support: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	
Inband management: <input checked="" type="radio"/> Enable <input type="radio"/> Disable	

OK **Close**

Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

Login: **admin**

Password: **xxxxxxxx**

StorEdge 2Gb FC Switch 64 #> **admin start**

StorEdge 2Gb FC Switch 64 (admin) #> **config edit**

StorEdge 2Gb FC Switch 64 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1] **<choose a unique number>**

DomainIDLock (True / False) [False] **True**

SymbolicName (string, max=32 chars) [StorEdge 2Gb FC Switch 64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [10000]

E_D_TOV (decimal value, 10-20000 msec) [2000]

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

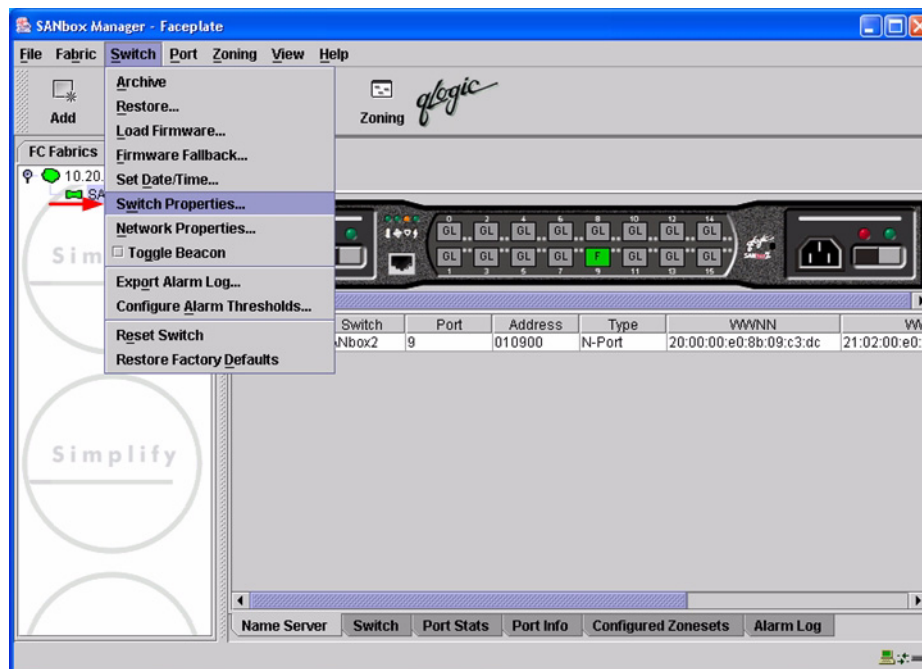
StorEdge 2Gb FC Switch 64 (admin-config) #> **config save**

StorEdge 2Gb FC Switch 64 (admin) #> **config activate**

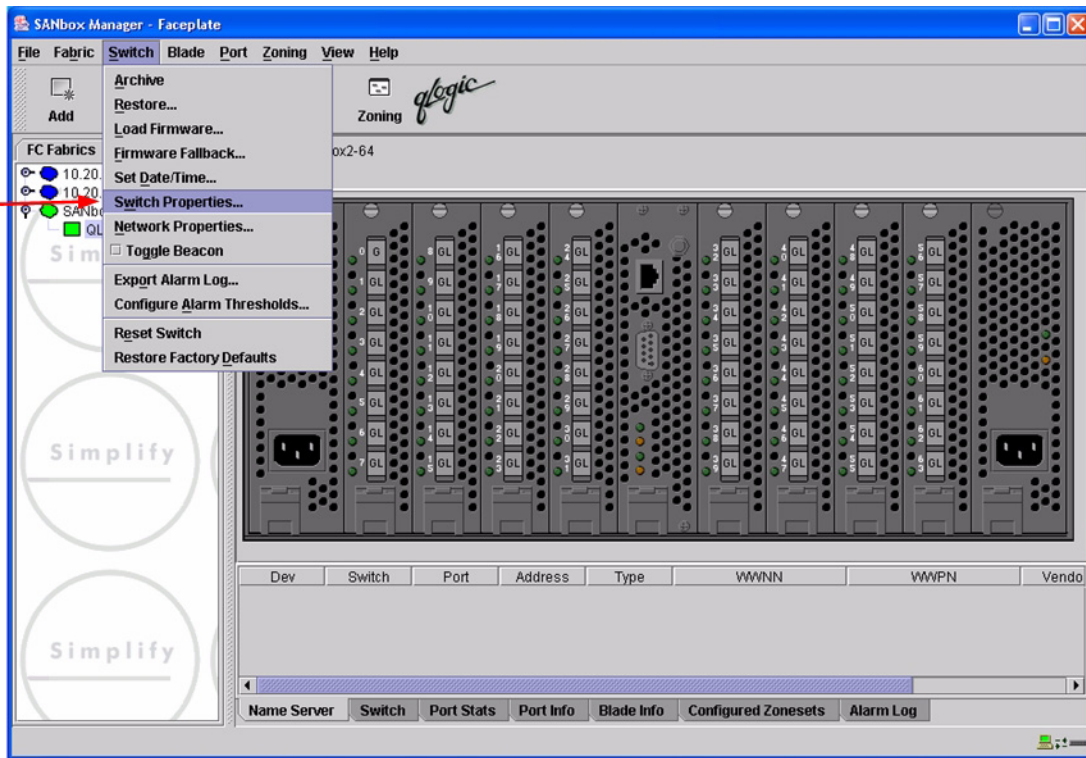
The configuration will be activated. Please confirm (y/n): [n] **y**

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, do the following:
 - a. In the **Domain ID** box, type a unique Domain ID for the switch.
 - b. In the **Domain ID Lock** field, select **Enable** to ensure that the switch always has that Domain ID.
 - c. Click **OK**.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:19 FC Address: 010000
Operational State: online Firmware Version: V1.3-56-0
Chassis Name: SANbox2 MAC address: 00:c0:dd:00:72:1a
IP Address: 10.20.67.16

Chassis Name: SANbox2
Administrative State: online
Domain ID: 1
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

For the QLogic SANbox2-64, the following displays:

Switch Properties - SANbox Manager

World Wide Name: 10:00:00:c0:dd:00:72:bb FC Address: 780000
Operational State: online Firmware Version: V1.4.0.36-0
Chassis Name: QLogic SANbox2-64 MAC address: 00:c0:dd:00:72:ba
IP Address: 10.20.67.1

Chassis Name: QLogic SANbox2-64
Administrative State: online
Domain ID: 120
Domain ID lock: ☒ Enable ☐ Disable
Broadcast Support: ☒ Enable ☐ Disable
In-band Management: ☒ Enable ☐ Disable

Timeout Values
R_A_TOV: 10000
R_T_TOV: 100
E_D_TOV: 2000

OK Close

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **admin start**

SANbox2 (admin) #> **config edit**

SANbox2 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1] **<choose a unique number>**

DomainIDLock (True / False) [False] **True**

SymbolicName (string, max=32 chars) [QLogic SANbox 2-64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [10000]

E_D_TOV (decimal value, 10-20000 msec) [2000]

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> **config save**

SANbox2 (admin) #> **config activate**

The configuration will be activated. Please confirm (y/n): [n] **y**

Timeout Values

As per FC-SW-2 Fibre Channel standards, set all switches to the following timeout values (TOV) in order to successfully establish an E-port connection:

R_A_TOV = 10 seconds
E_D_TOV = 2 seconds

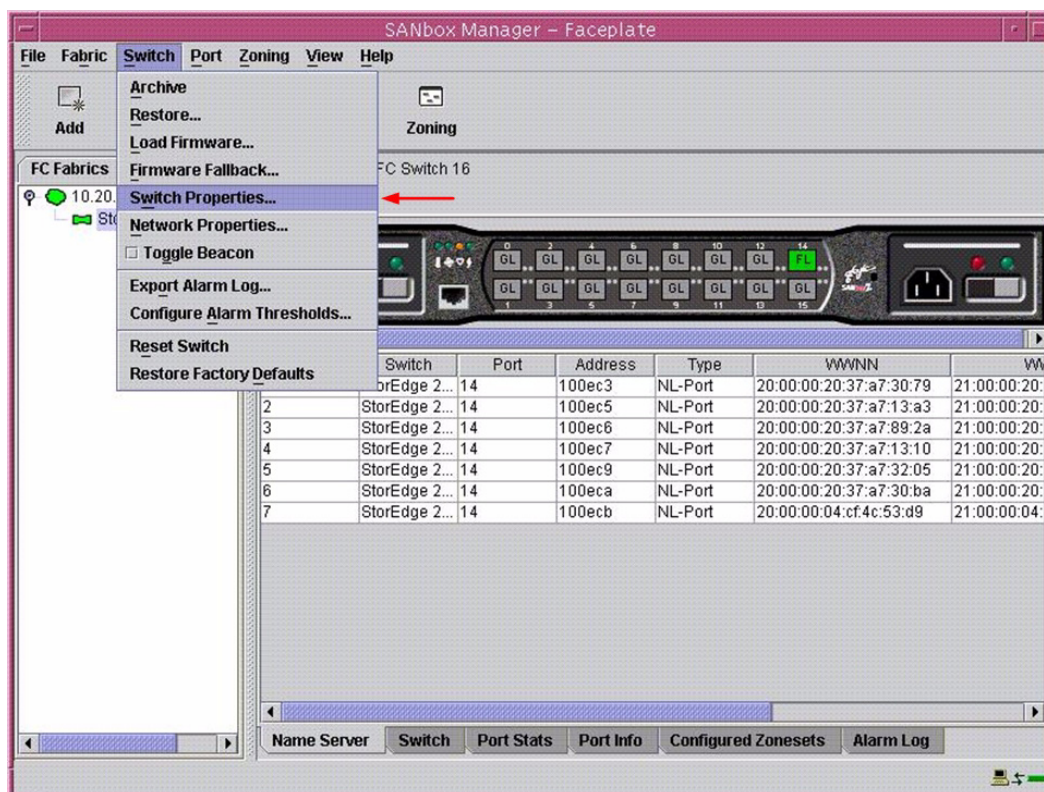
This section provides the steps to change these values.

Sun StorEdge SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

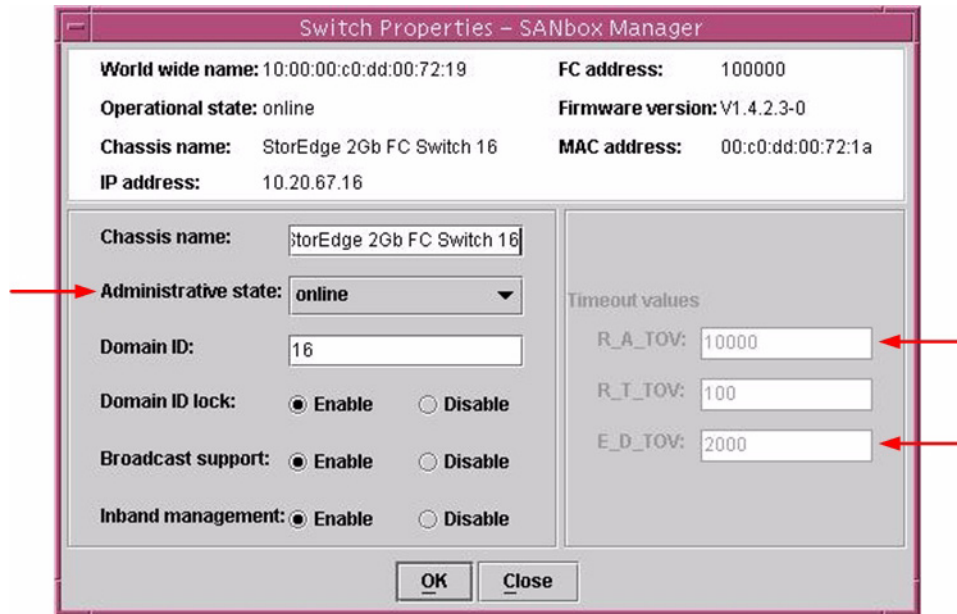
1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box ([see step 2](#)). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box ([see step 2](#)). In the **Administrative State** list, select **Online**. Click **OK**.

Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

Login: **admin**

Password: **xxxxxxxx**

StorEdge 2Gb FC Switch 64 #> **show config switch**

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

StorEdge 2Gb FC Switch 64 #> **admin start**

StorEdge 2Gb FC Switch 64 (admin) #> **config edit**

StorEdge 2Gb FC Switch 64 (admin-config) #> **set config switch**

The following options display:

AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]

BroadcastEnabled (True / False) [True]

InbandEnabled (True / False) [True]

DefaultDomainID (decimal value, 1-239) [1]

DomainIDLock (True / False) [True]

SymbolicName (string, max=32 chars) [StorEdge 2Gb FC Switch 64]

R_T_TOV (decimal value, 1-1000 msec) [100]

R_A_TOV (decimal value, 100-100000 msec) [9000] **10000**

E_D_TOV (decimal value, 10-20000 msec) [1000] **2000**

FS_TOV (decimal value, 100-100000 msec) [5000]

DS_TOV (decimal value, 100-100000 msec) [5000]

PrincipalPriority (decimal value, 1-255) [254]

ConfigDescription (string, max=64 chars) [Default Config]

StorEdge 2Gb FC Switch 64 (admin-config) #> **config save**

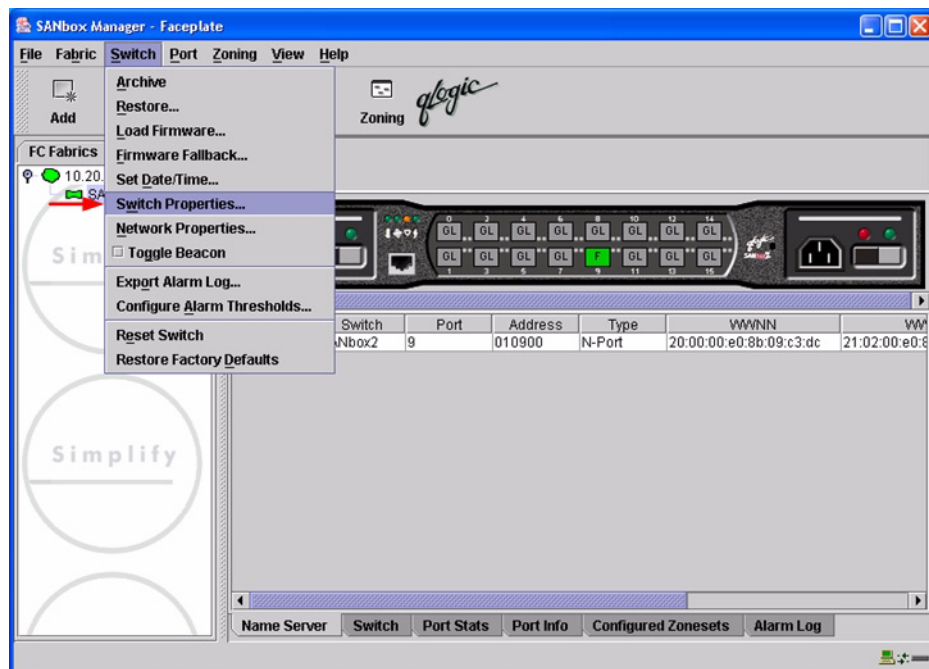
StorEdge 2Gb FC Switch 64 (admin) #> **config activate**

The configuration will be activated. Please confirm (y/n): [n] **y**

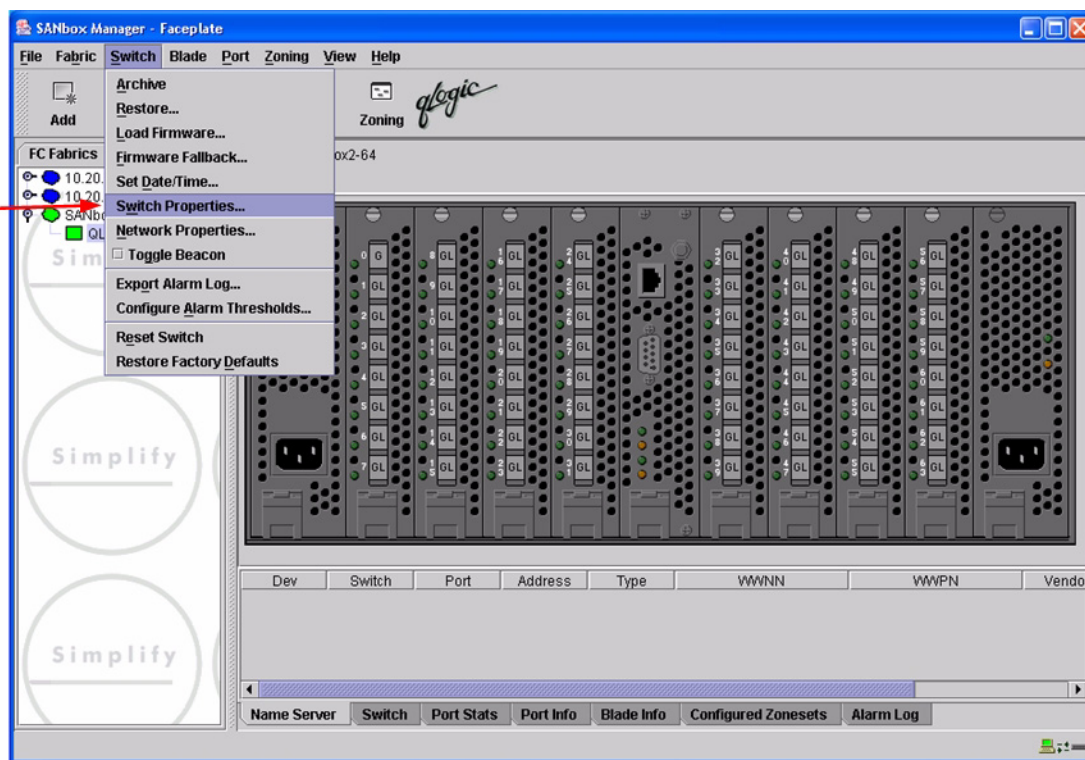
QLogic SANbox Manager GUI

ATTENTION!! The following steps take the switch offline; therefore, do not perform them on a switch being managed in-band.

1. Start the **SANbox Manager** application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Switch** menu, select **Switch Properties**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

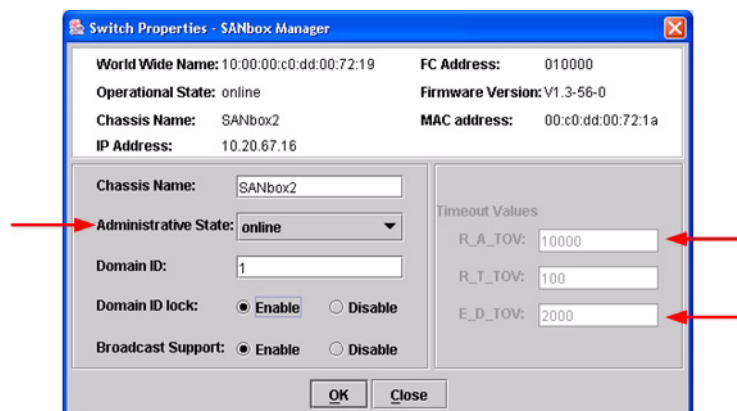


For the QLogic SANbox2-64, the following displays:

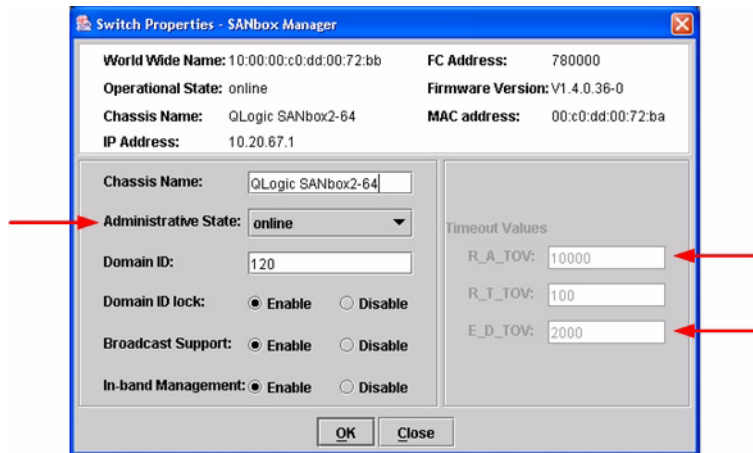


3. From the **Switch Properties—SANbox Manager** dialog box, verify that **R_A_TOV** is set to **10000** and **E_D_TOV** is set to **2000**. If the settings are not correct, proceed to [step 4](#). If the settings are correct, no changes need to be made; proceed to the next appropriate section.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



4. From the **Switch Properties—SANbox Manager** dialog box **Administrative State** list, select **offline**. Click **OK**.
5. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). Do the following:
 - a. In the **R_A_TOV** box, change the setting to **10000**.
 - b. In the **E_D_TOV** box, change the setting to **2000**.
 - c. Click **OK**.
6. Re-enter the **Switch Properties—SANbox Manager** dialog box (see step 2). In the **Administrative State** list, select **Online**. Click **OK**.

QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

```
Login: admin
Password: xxxxxxxx
SANbox2 #> show config switch
```

Use the above command to verify that R_A_TOV is set to 10000 and E_D_TOV is set to 2000. If these timeout values are not correct, continue with this section. If the settings are correct, no changes need to be made; proceed with the next appropriate section.

```
SANbox2 #> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

The following options display:
AdminState (1=Online, 2=Offline, 3=Diagnostics) [Online]
BroadcastEnabled (True / False) [True]
InbandEnabled (True / False) [True]
DefaultDomainID (decimal value, 1-239) [1]
DomainIDLock (True / False) [True]
SymbolicName (string, max=32 chars) [QLogic SANbox2-64]
R_T_TOV (decimal value, 1-1000 msec) [100]
R_A_TOV (decimal value, 100-100000 msec) [9000]    10000
E_D_TOV (decimal value, 10-20000 msec) [1000]    2000
FS_TOV (decimal value, 100-100000 msec) [5000]
DS_TOV (decimal value, 100-100000 msec) [5000]
PrincipalPriority (decimal value, 1-255) [254]
ConfigDescription (string, max=64 chars) [Default Config]

SANbox2 (admin-config) #> config save
SANbox2 (admin) #> config activate

The configuration will be activated. Please confirm (y/n): [n] y
```

Principal Switch Configuration

Sun switches and QLogic switches negotiate for principal switch automatically. Therefore, there are no steps to take.

Zone Configuration

This section discusses configuring active Zone Set names and Zone types.

Active Zone Set Names

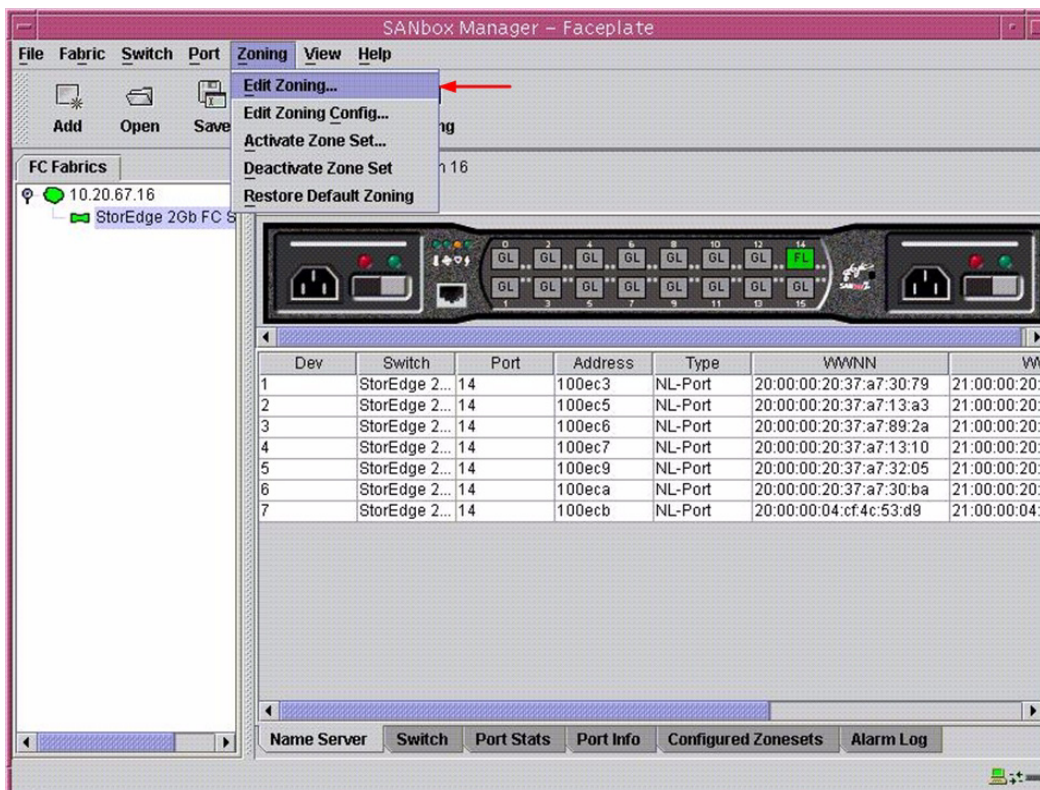
The Zone and Zone Set names on each switch must be unique. If not, change one of the duplicate names. All Zone Set and Zone names must conform to the Fibre Channel (FC) Standards for Zone Naming (ANSI T11/00-427v3):

1. Must be 1–64 characters in length.
2. All characters are ASCII.
3. First character is [a–z] or [A–Z].
4. All other characters must be [a–z], [A–Z], [0–9], or the _ character. Other characters (\$-^) may not be supported by all vendors and should be avoided.

Sun StorEdge SANbox Manager GUI

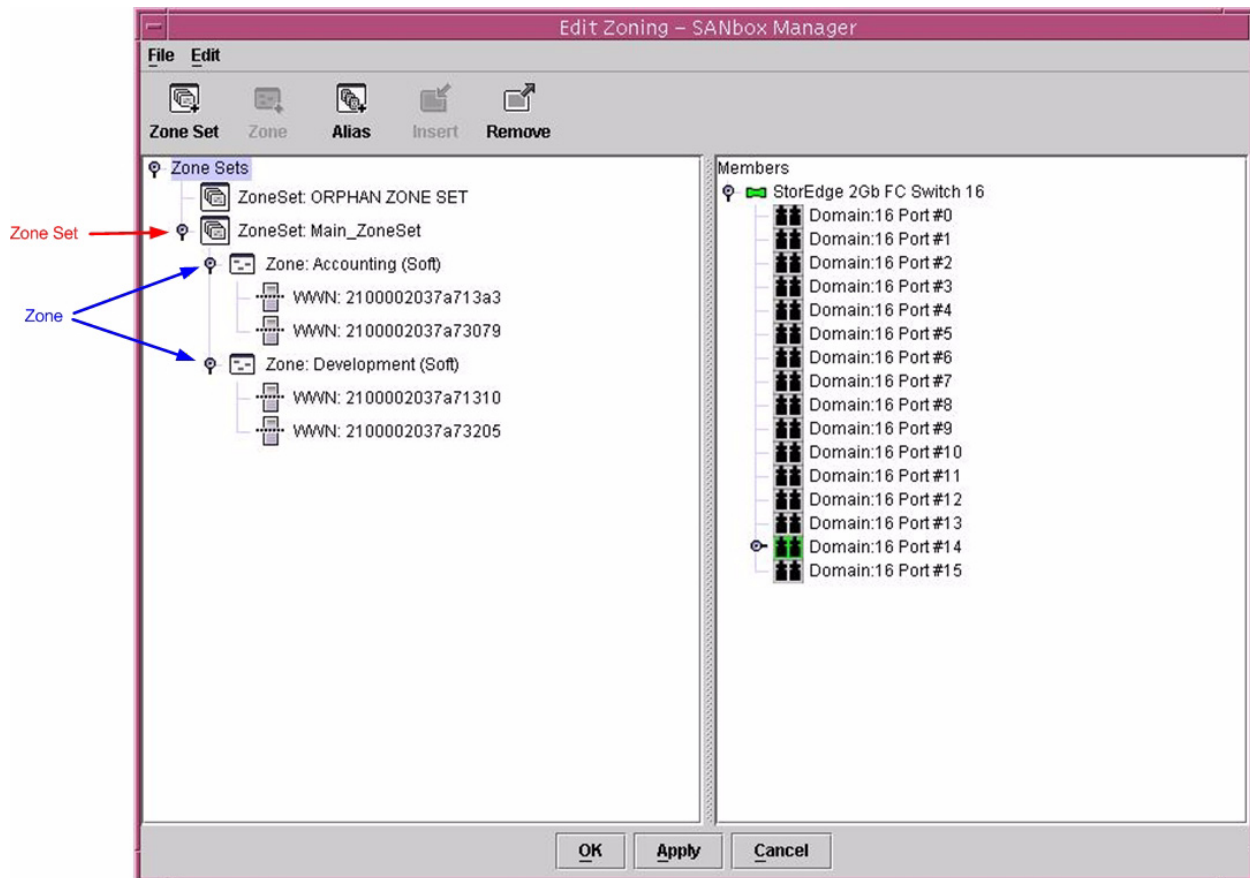
1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



- From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 279.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



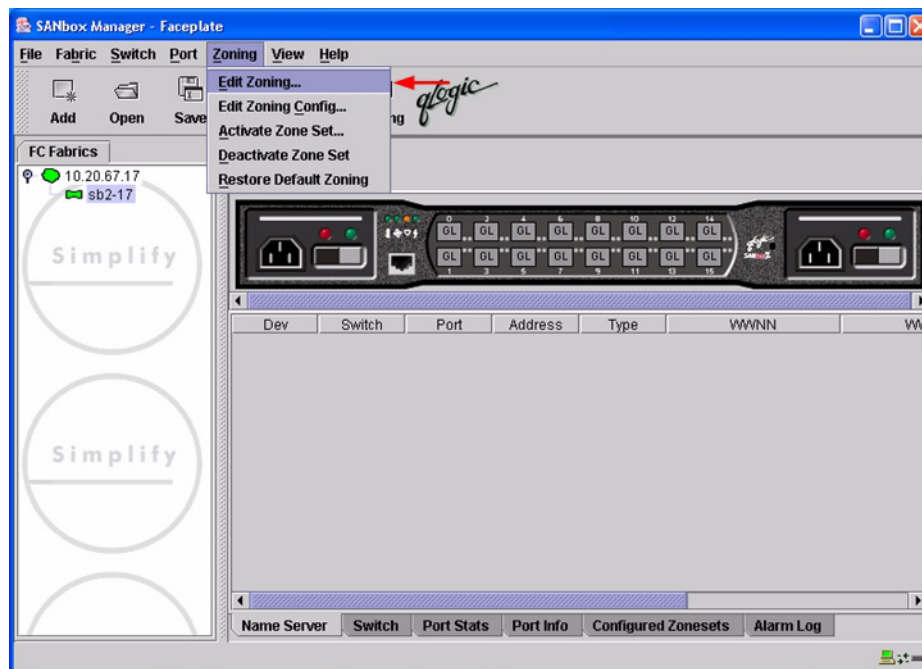
Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

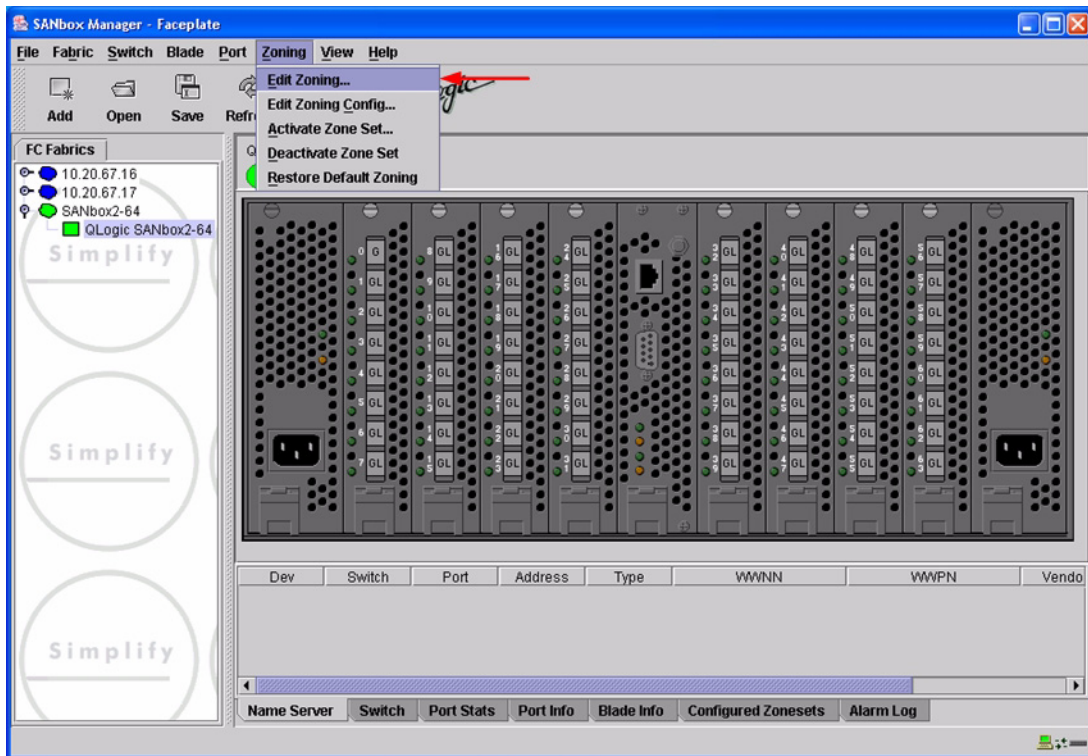
```
Login: admin
Password: xxxxxxxxxx
StorEdge 2Gb FC Switch 64 #> zone list
```

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

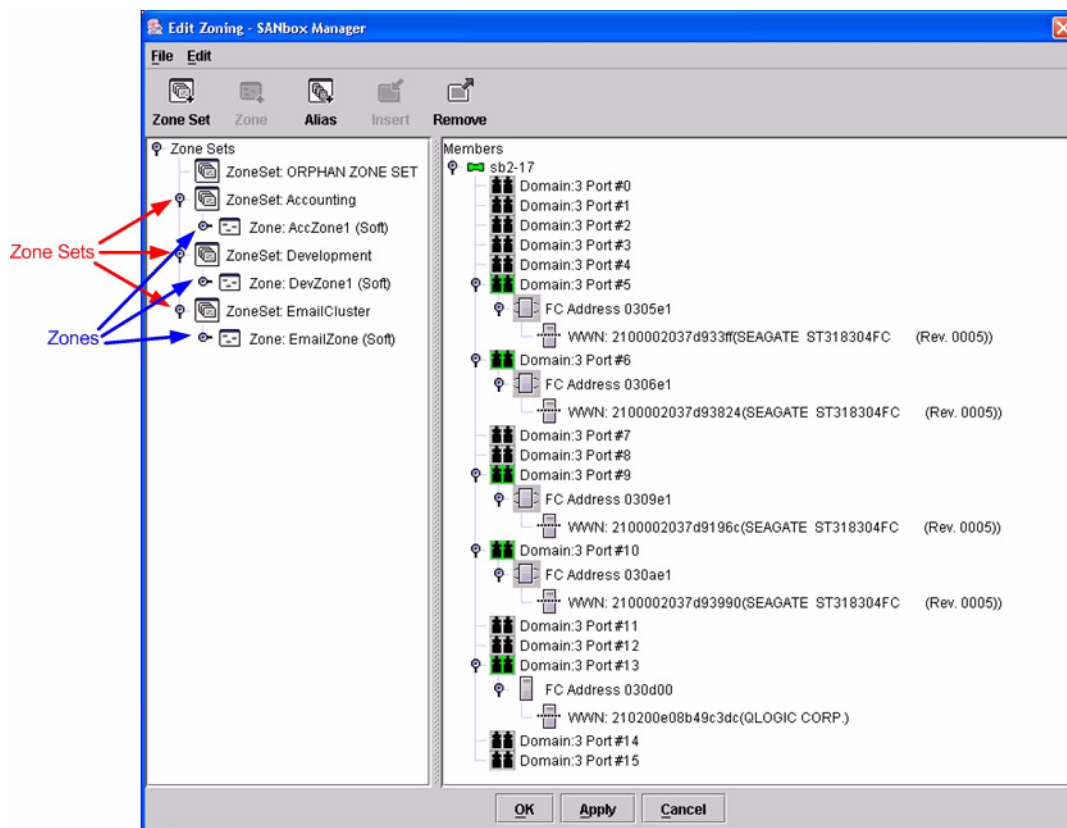


For the QLogic SANbox2-64, the following displays:

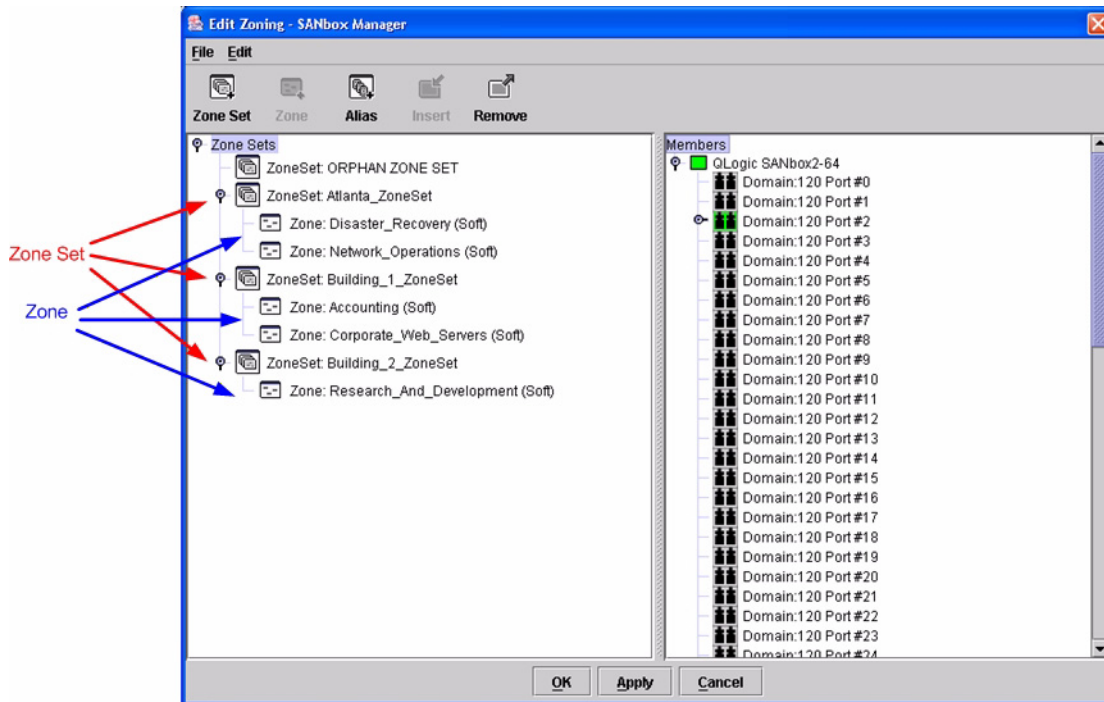


3. From the **Edit Zoning—SANbox Manager** dialog box, compare the Zone Set and Zone names from each switch to ensure there are none with the same name and the names conform to the standards for zone naming as discussed under [“Active Zone Set Names”](#) on page 279.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2 #> **zone list**

Zone Types

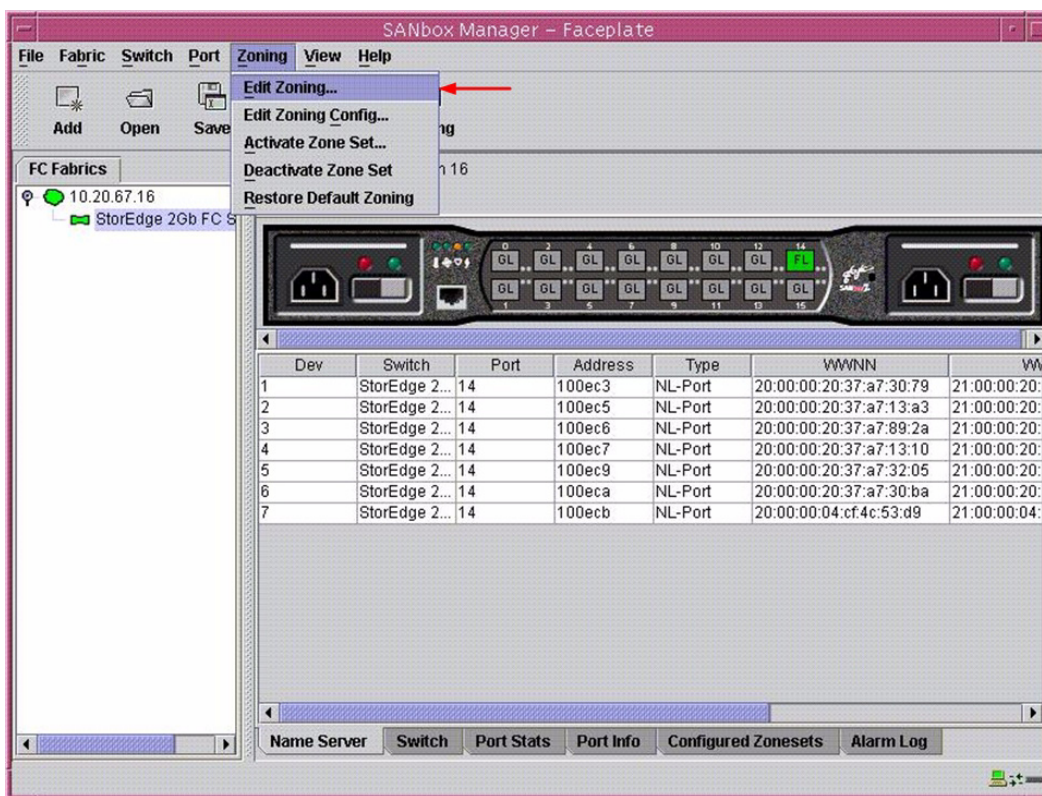
All zone members must be specified by a world wide port name (WWPN) in order to comply with Fibre Channel standards. Any zone member not specified by WWPN cannot participate in the fabric. Below are steps to confirm the zone types.

NOTE: A world wide name (WWN) consists of a world wide node name (WWNN) and one or more WWPNs. References in this guide to WWN actually refer to the WWPN.

Sun StorEdge SANbox Manager GUI

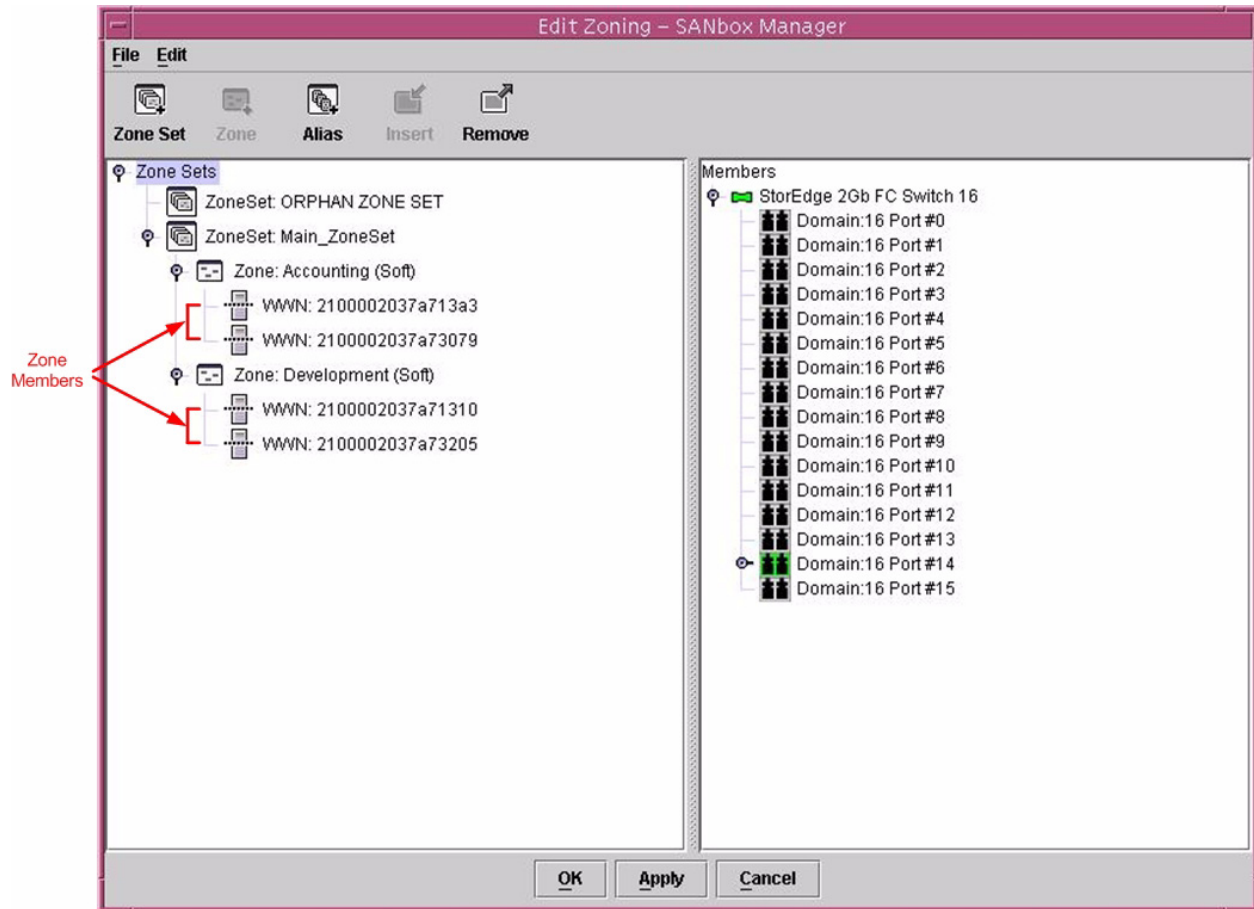
1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the Sun StorEdge Network 2 Gb FC Switch-8 and Sun StorEdge Network 2 Gb FC Switch-16, the following displays:



Sun StorEdge CLI

NOTE: Use the CLI commands when the Sun StorEdge SANbox Manager GUI is not available. The procedures are the same for the Sun StorEdge Network 2 Gb FC Switch-8, Sun StorEdge Network 2 Gb FC Switch-16, and Sun StorEdge Network 2 Gb FC Switch-64.

Login: **admin**

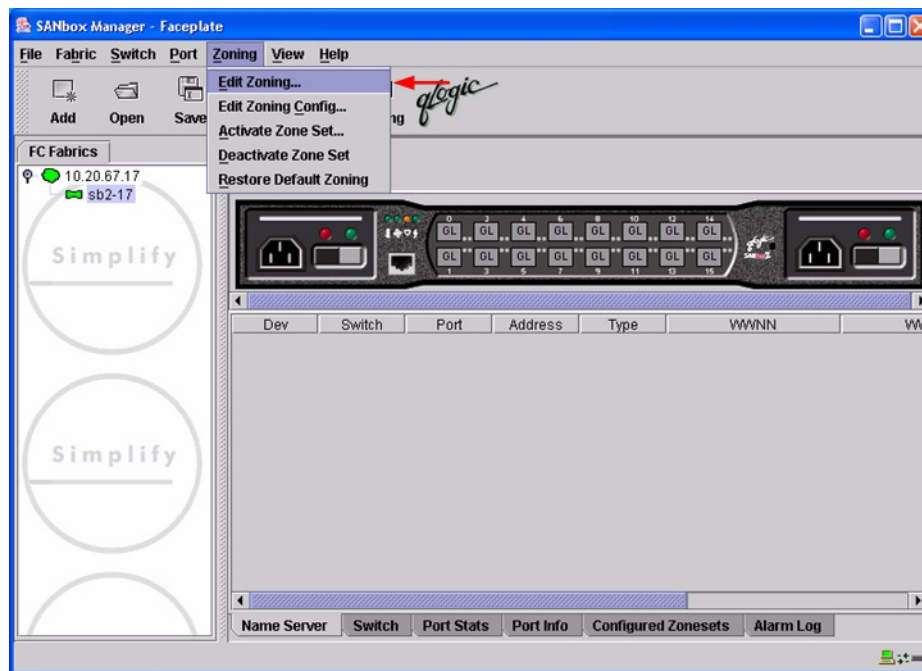
Password: **xxxxxxxx**

StorEdge 2Gb FC Switch 64 #> **zone list <zone name>**

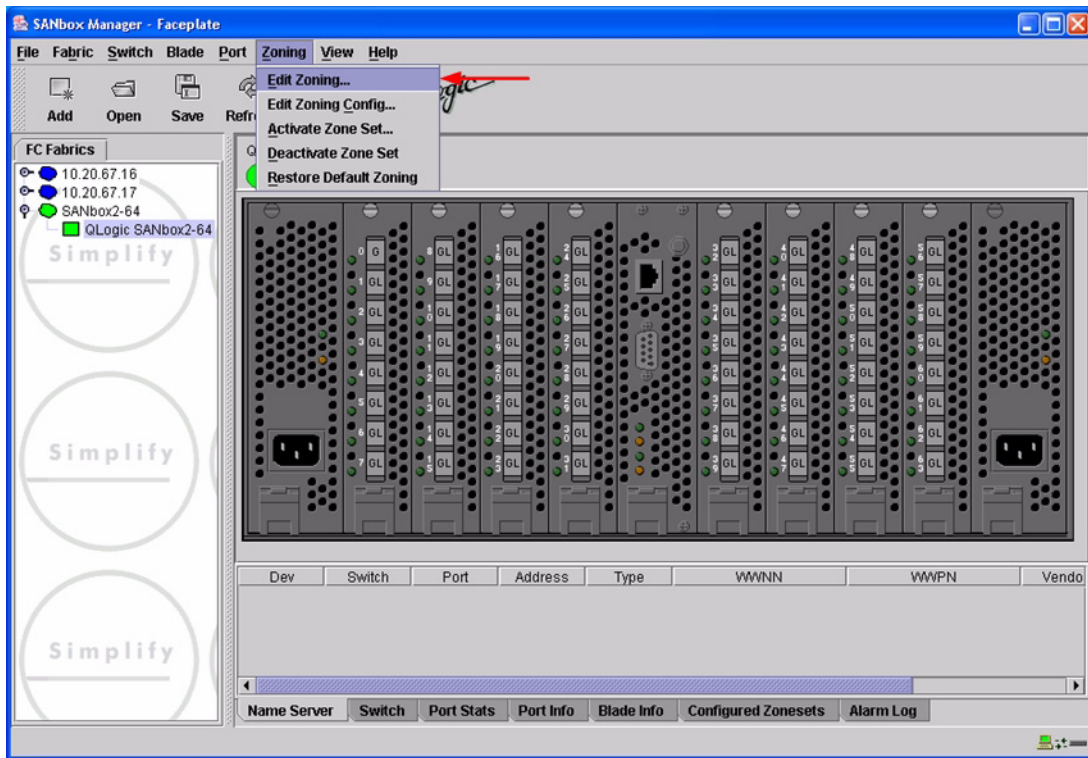
Confirm that only WWNs are listed.

QLogic SANbox Manager GUI

1. Start the SANbox Manager application. The **SANbox Manager—Faceplate** dialog box displays.
2. From the **SANbox Manager—Faceplate** dialog box **Zoning** menu, select **Edit Zoning**.
For the QLogic SANbox2-8 and SANbox2-16, the following displays:

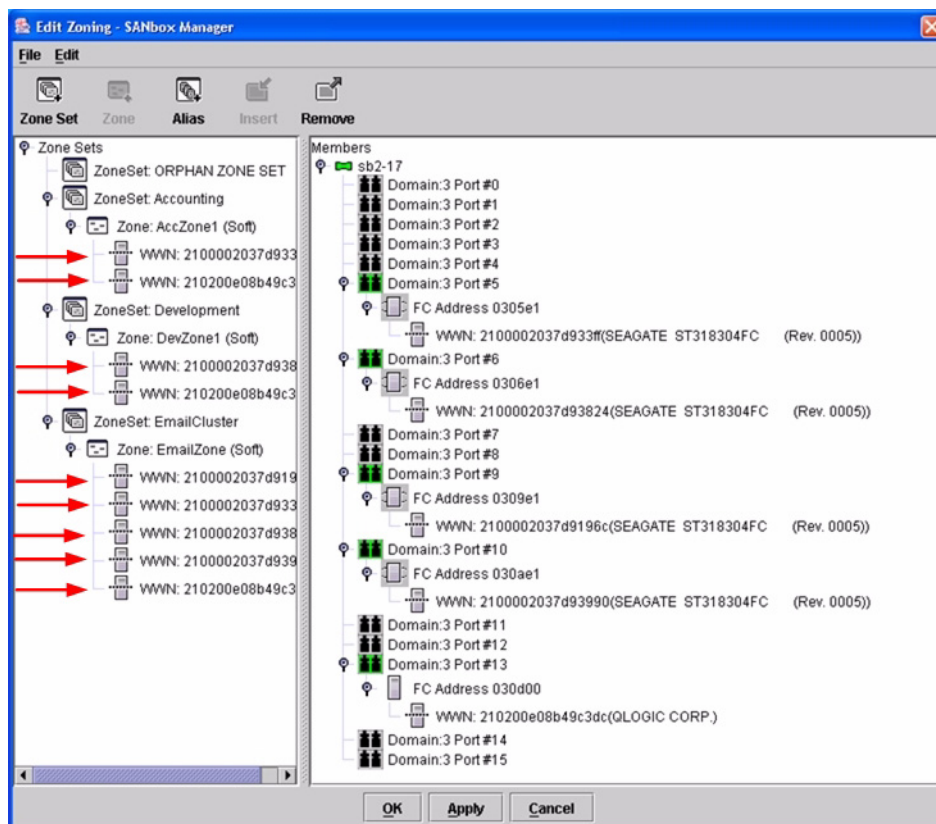


For the QLogic SANbox2-64, the following displays:

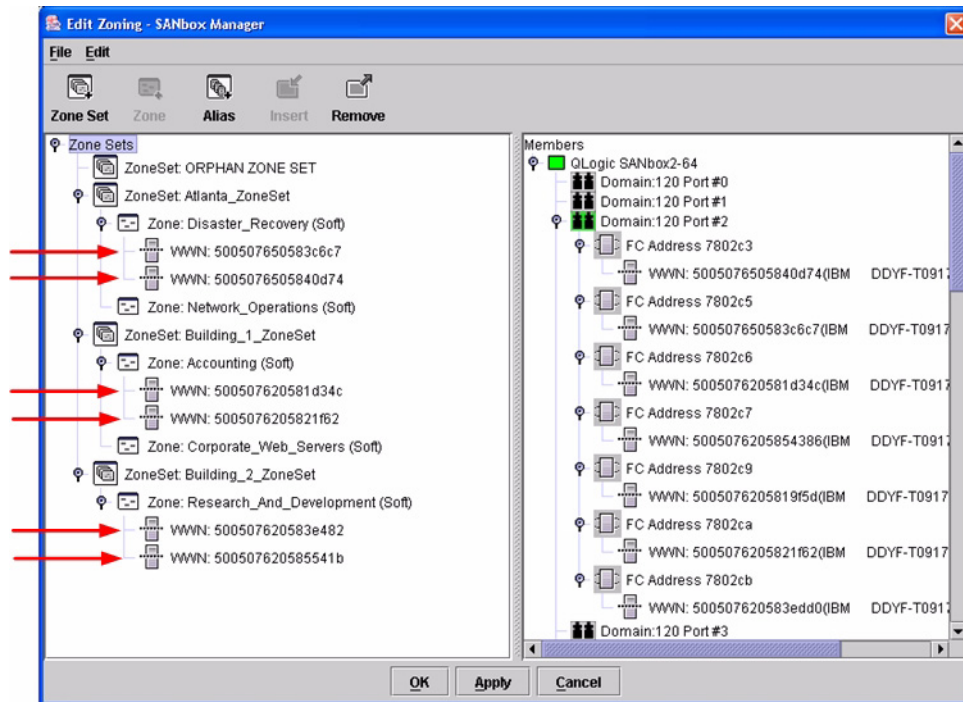


3. The **Edit Zoning—SANbox Manager** dialog box displays. Confirm that all zone members are listed as WWN.

For the QLogic SANbox2-8 and SANbox2-16, the following displays:



For the QLogic SANbox2-64, the following displays:



QLogic CLI

NOTE: Use the CLI commands when the QLogic SANbox Manager GUI is not available. The procedures are the same for the QLogic SANbox2-8, SANbox2-16, and SANbox2-64.

Login: **admin**

Password: **xxxxxxxx**

SANbox2#> **zone list <zone name>**

Confirm that only WWNs are listed.

Operating Mode Configuration

Not applicable.

Sun StorEdge Specific Configuration

Not applicable.

QLogic Specific Configuration

Not applicable.

Successful Integration Checklist

Perform the following steps after the E-port connection has been established and the fabric has had time to update. If everything verifies, the Sun and QLogic fabrics have successfully merged.

- ✓ Compare and verify that all Zoning information has been propagated on all switches.
- ✓ Verify that the correct Zone Set is activated.
- ✓ Compare and verify that all devices are in the Name Server of each switch.
- ✓ Verify that all initiators continue to detect and have access to all targets that existed prior to the fabric merger.

After everything is verified, your fabric has merged successfully and no additional steps need to be taken. If any of the above tasks did not complete successfully, please contact QLogic support.

Glossary

Activity LED

A port LED that indicates when frames are entering or leaving the port.

Alias

A collection of objects that can be zoned together. An alias is not a zone, and can not have a zone or another alias as a member.

ALFairness

On an arbitrated loop, the switch is always highest priority when arbitrating for the right to transfer. To prevent other devices from being locked out, the standard provides for a fairness mode, which if enabled, requires an arbitrator to let all other devices win arbitration before arbiting a second time.

AL PA

Arbitrated loop physical address

ANSI

American National Standards Institute

API

Application programming interface

Arbitrated Loop

A Fibre Channel topology where ports use arbitration to establish a point-to-point circuit.

Arbitrated Loop Physical Address (AL PA)

A unique one-byte valid value assigned during loop initialization to each NL port on a loop.

ARB_FF

When ARB_FF is enabled, it causes the switch to send the ARB_FF primitive when it is in monitoring mode, rather than idles. The only reason to do this is since the ARB_FF has less bit transitions than does an idle, it produces less EMI. It has no other effect.

ASIC

Application specific integrated circuit

BootP

A type of network server.

Buffer Credit

A measure of port buffer capacity equal to one frame.

Class 2 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports with acknowledgment provided.

Class 3 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports without acknowledgment.

CLI

Command line interface

Domain ID

User defined name that identifies the switch in the fabric.

E_D_TOV

Error-detect timeout value

E-Port

Expansion port. A switch port that connects to another FC-SW-2 compliant switch.

Expansion Port

See E-Port.

ExtCredit

Allows full speed operation over distances greater than 10 kilometers. Additional credit buffers are borrowed from other ports (which must be set to donor state). Decimal value 0–65535.

Fabric Management Switch

The switch through which the fabric is managed.

Fabric Name

User-defined name associated with the file that contains user list data for the fabric.

FSPF

Fabric shortest path first

Fan Fail LED

An LED that indicates that a cooling fan in the switch is operating below standard.

FC-PLDA

Fibre Channel-private loop direct attach

FC-SW-2

Fibre Channel switch fabric 2. For detailed information, see the **Introduction on [page 1](#)**.

Flash Memory

Memory on the switch that contains the chassis control firmware.

Frame

Data unit consisting of a start-of-frame (SOF) delimiter, header, data payload, CRC, and an end-of-frame (EOF) delimiter.

FRU

Field replaceable unit

GUI

Graphical user interface

Heartbeat LED

A chassis LED that indicates the status of the internal switch processor and the results of the power-on self-test.

Initiator

The device that initiates a data exchange with a target device.

In-Order-Delivery

A feature that requires that frames be received in the same order in which they were sent.

Input Power LED

A chassis LED that indicates that the switch logic circuitry is receiving proper DC voltages.

InteropCredit

This variable determines the number of credits we will advertise on an ISL. Older versions of Brocade software required that we match their offering. Decimal value is 0–255.

IP

Internet protocol

ISLSecurity

ISLSecurity determines which switches a port will establish a link with. Any: we will link with any switch. Ours: we will only link to another QLogic switch. None: the port will not establish an ISL link.

LCFEnable

LCFEnable gives preference to link control frames (such as class 2 ACK frames) over other frames, when queued for transmission in the switch. This may provide better performance when running Class 2 traffic. LCFEnable is incompatible with MFSEnable, and both cannot be selected.

LIP

Loop initialization primitive sequence

Logged-in LED

A port LED that indicates device login or loop initialization status.

Management Information Base

A set of guidelines and definitions for the Fibre Channel functions.

Management Workstation

PC workstation that manages the fabric through the fabric management switch.

MIB

Management information base

MSEnable

Determines whether GS-3 management server commands will be accepted on the port. It can be used to prevent in-band management of the switch on any or all ports.

NL_Port

Node Loop Port. A Fibre Channel device port that supports arbitrated loop protocol.

N_Port

Node Port. A Fibre Channel device port in a point-to-point or fabric connection.

NoClose

Causes the switch to keep the loop open, if no other device is arbitrating. It is intended to improve performance when there is a single L_Port device connected to the switch.

Output Power LED

A power supply LED that indicates that the power supply is providing DC voltage to the switch

Over Temperature LED

A chassis LED or a power supply LED that indicates that the switch or power supply is overheating.

POST

Power-on self-test

Power-On Self-Test

Diagnostics that the switch chassis performs at start up.

Principal Switch

A switch that has been selected to perform certain fabric configuration duties.

Private Device

A device that can communicate only with other devices on the same loop.

Private Loop

A loop of private devices connected to a single switch port.

pwwn

Port world wide name. See World Wide Port Name.

R_A_TOV

Resource-allocation timeout value

SAN

Storage area network

SANbox Manager

Switch management application

SFF

Small form-factor transceiver

SFP

Small form-factor pluggable. A transceiver device, smaller than a gigabit interface converter, that plugs into the Fibre Channel port.

Small Form Factor

A transceiver device, smaller than a gigabit interface converter, that is permanently attached to the circuit board.

Small Form-Factor Pluggable

A transceiver device, smaller than a gigabit interface converter, that plugs into the Fibre Channel port.

SNMP

Simple network management protocol

Target

A storage device that responds to an initiator device.

Timeout Values

The timeout values (TOV) required by the FC-SW-2 standard to successfully establish an E-port connection.

TOV

Timeout values. The timeout values required by the FC-SW-2 standard to successfully establish an E-port connection.

VCCI

Voluntary control council for interference

VIEnable

Diagnostics that the switch chassis performs at start up.

.device manufacturer.

FC-VI. When enabled, VI preference frames will be transmitted ahead of other frames.

World Wide Name (WWN)

A unique 64-bit address assigned to a device. The WWN consists of a world wide node name and a world wide port name.

World Wide Node Name (WWNN)

A unique address assigned to a device.

World Wide Port Name (WWPN)

A unique address assigned to a port on a device. There can be more than one WWPN per WWNN.

WWN

World wide name

WWNN

World wide node name

WWPN

World wide port name

Zone

A set of ports or devices grouped together to control the exchange of information.

Zone Set

A set of zones grouped together. The active zone set defines the zoning for a fabric.

Index

B

Brocade fabrics, merging with QLogic fabrics 7

Brocade SilkWorm 3200 and SilkWorm 3800 switches

- Brocade specific configuration 37
- configuration limitations 10
- domain ID configuration 11
- integration checklist 9
- operating mode configuration 37
- principal switch configuration 24
- QLogic specific configuration 38
- successful integration checklist 38
- switch and firmware versions 10
- timeout values 18
- zone configuration 25

Brocade SilkWorm 3900 and SilkWorm 12000 switches

- Brocade specific configuration 68
- configuration limitations 40
- domain ID configuration 41
- integration checklist 39
- operating mode configuration 68
- principal switch configuration 54
- QLogic specific configuration 68
- successful integration checklist 69
- switch and firmware versions 40
- timeout values 48
- zone configuration 55

C

Cisco fabrics, merging with QLogic fabrics 71

Cisco MDS 9000 series switches

- Cisco specific configuration 118
- configuration limitations 93
- domain ID configuration 94

integration checklist 93

- operating mode configuration 118
- principal switch configuration 107
- QLogic specific configuration 118
- successful integration checklist 118
- switch and firmware versions 94
- timeout values 100
- zone configuration 107

Cisco SN 5428 storage router

- Cisco specific configuration 91
- configuration limitations 73
- domain ID configuration 75
- integration checklist 73
- operating mode configuration 90
- principal switch configuration 85
- QLogic specific configuration 92
- successful integration checklist 92
- switch and firmware versions 74
- timeout values 81
- zone configuration 86

Configuration limitations

- Brocade SilkWorm 3200 and SilkWorm 3800 switches 10

- Brocade SilkWorm 3900 and SilkWorm 12000 switches 40

- Cisco MDS 9000 series switches 93

- Cisco SN 5428 storage router 73

- IBM eServer BladeCenter Fibre Channel Switch Module 121

- INRANGE FC/9000 switch 150

- McDATA Intrepid 6000 series directors 221

- McDATA Sphereon 4500 switch 183

- Sun StorEdge Network 2 Gb FC series switches 263

Contacting QLogic 305

D

Domain ID configuration
 Brocade SilkWorm 3200 and SilkWorm 3800 switches 11
 Brocade SilkWorm 3900 and SilkWorm 12000 switches 41
 Cisco MDS 9000 series switches 94
 Cisco SN 5428 storage router 75
 IBM eServer BladeCenter Fibre Channel Switch Module 123
 INRANGE FC/9000 switch 150
 McDATA Intrepid 6000 series directors 222
 McDATA Sphereon 4500 switch 184
 Sun StorEdge Network 2 Gb FC series switches 265

F

FC-SW-2 standard 1

G

Glossary 293

H

How to use this guide 5

I

IBM BladeCenter fabrics, merging with QLogic fabrics 119
IBM eServer BladeCenter Fibre Channel Switch Module
 configuration limitations 121
 domain ID configuration 123
 IBM BladeCenter specific configuration 144
 integration checklist 121
 operating mode configuration 143
 principal switch configuration 136
 QLogic specific configuration 144
 successful integration checklist 145
 switch and firmware versions 122
 timeout values 130

 zone configuration 137

INRANGE fabrics, merging with QLogic fabrics 147

INRANGE FC/9000 switch
 configuration limitations 150
 domain ID configuration 150
 INRANGE specific configuration 178
 integration checklist 149
 operating mode configuration 178
 principal switch configuration 160
 QLogic specific configuration 179
 successful integration checklist 179
 switch and firmware versions 150
 timeout values 155
 zone configuration 161

Integration checklist

 Brocade SilkWorm 3200 and SilkWorm 3800 switches 9

 Brocade SilkWorm 3900 and SilkWorm 12000 switches 39

 Cisco MDS 9000 series switches 93

 Cisco SN 5428 storage router 73

 IBM eServer BladeCenter Fibre Channel Switch Module 121

 INRANGE FC/9000 switch 149

 McDATA Intrepid 6000 series directors 221

 McDATA Sphereon 4500 switch 183

 Sun StorEdge Network 2 Gb FC series switches 263

Introduction to this guide 1

M

McDATA fabrics, merging with QLogic fabrics 181

McDATA Intrepid 6000 series directors
 configuration limitations 221

 domain ID configuration 222

 integration checklist 221

 McDATA specific configuration 258

 operating mode configuration 254

 principal switch configuration 239

- QLogic specific configuration 258
- successful integration checklist 259
- switch and firmware versions 222
- timeout values 231
- zone configuration 240
- McDATA Sphereon 4500 switch
 - configuration limitations 183
 - domain ID configuration 184
 - integration checklist 183
 - McDATA specific configuration 218
 - operating mode configuration 214
 - principal switch configuration 200
 - QLogic specific configuration 218
 - successful integration checklist 219
 - switch and firmware versions 184
 - timeout values 192
 - zone configuration 201
- Merging QLogic fabrics and
 - Brocade fabrics 7
 - Cisco fabrics 71
 - IBM BladeCenter fabrics 119
 - INRANGE fabrics 147
 - McDATA fabrics 181
 - Sun fabrics 261

O

- Operating mode configuration
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 37
 - Brocade SilkWorm 3900 and SilkWorm 12000 switches 68
 - Cisco MDS 9000 series switches 118
 - Cisco SN 5428 storage router 90
 - IBM eServer BladeCenter Fibre Channel Switch Module 143
 - INRANGE FC/9000 switch 178
 - McDATA Intrepid 6000 series directors 254
 - McDATA Sphereon 4500 switch 214
 - Sun StorEdge Network 2 Gb FC series switches 292

P

- Principal switch configuration
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 24
 - Brocade SilkWorm 3900 and SilkWorm 12000 switches 54
 - Cisco MDS 9000 series switches 107
 - Cisco SN 5428 storage router 85
 - IBM eServer BladeCenter Fibre Channel Switch Module 136
 - INRANGE FC/9000 switch 160
 - McDATA Intrepid 6000 series directors 239
 - McDATA Sphereon 4500 switch 200
 - Sun StorEdge Network 2 Gb FC series switches 278

Q

- QLogic
 - contacting 305
 - Web site for updated versions of this guide 5
- QLogic specific configuration
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 38
 - Brocade SilkWorm 3900 and SilkWorm 12000 switches 68
 - Cisco MDS 9000 series switches 118
 - Cisco SN 5428 storage router 92
 - IBM eServer BladeCenter Fibre Channel Switch Module 144
 - INRANGE FC/9000 switch 179
 - McDATA Intrepid 6000 series directors 258
 - McDATA Sphereon 4500 switch 218
 - Sun StorEdge Network 2 Gb FC series switches 292

S

- Specific configuration
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 37
 - Brocade SilkWorm 3900 and SilkWorm 12000 switches 68

- Cisco MDS 9000 series switches 118
- Cisco SN 5428 storage router 91
- IBM eServer BladeCenter Fibre Channel Switch Module 144
- INRANGE FC/9000 switch 178
- McDATA Intrepid 6000 series directors 258
- McDATA Sphereon 4500 switch 218
- Sun StorEdge Network 2 Gb FC series switches 292
- Successful integration checklist
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 38
 - Brocade SilkWorm 3900 and SilkWorm 12000 switches 69
 - Cisco MDS 9000 series switches 118
 - Cisco SN 5428 storage router 92
 - IBM eServer BladeCenter Fibre Channel Switch Module 145
 - INRANGE FC/9000 switch 179
 - McDATA Intrepid 6000 series directors 259
 - McDATA Sphereon 4500 switch 219
 - Sun StorEdge Network 2 Gb FC series switches 292
- Sun fabrics, merging with QLogic fabrics 261
- Sun StorEdge Network 2 Gb FC series switches
 - configuration limitations 263
 - domain ID configuration 265
 - integration checklist 263
 - operating mode configuration 292
 - principal switch configuration 278
 - QLogic specific configuration 292
 - successful integration checklist 292
 - Sun StorEdge specific configuration 292
 - switch and firmware versions 264
 - timeout values 272
 - zone configuration 279
- Switch and firmware versions 3
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 10

- Brocade SilkWorm 3900 and SilkWorm 12000 switches 40
- Cisco MDS 9000 series switches 94
- Cisco SN 5428 storage router 74
- IBM eServer BladeCenter Fibre Channel Switch Module 122
- INRANGE FC/9000 switch 150
- McDATA Intrepid 6000 series directors 222
- McDATA Sphereon 4500 switch 184
- Sun StorEdge Network 2 Gb FC series switches 264

T

- Timeout values
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 18
 - Brocade SilkWorm 3900 and SilkWorm 12000 switches 48
 - Cisco MDS 9000 series switches 100
 - Cisco SN 5428 storage router 81
 - IBM eServer BladeCenter Fibre Channel Switch Module 130
 - INRANGE FC/9000 switch 155
 - McDATA Intrepid 6000 series directors 231
 - McDATA Sphereon 4500 switch 192
 - Sun StorEdge Network 2 Gb FC series switches 272

U

- Using this guide 5

Z

- Zone configuration
 - Brocade SilkWorm 3200 and SilkWorm 3800 switches 25
 - Brocade SilkWorm 3900 and SilkWorm 12000 switches 55
 - Cisco MDS 9000 series switches 107
 - Cisco SN 5428 storage router 86
 - IBM eServer BladeCenter Fibre Channel Switch Module 137

INRANGE FC/9000 switch 161
McDATA Intrepid 6000 series directors 240
McDATA Sphereon 4500 switch 201
Sun StorEdge Network 2 Gb FC series
switches 279

Contacting QLogic

For more information about QLogic markets and applications, sales channels, products, milestones and technology roadmaps, please visit the QLogic Web site at www.qlogic.com or use one of the following contact numbers.

Locations

North American Corporate Headquarters

26650 Aliso Viejo Parkway
Aliso Viejo, CA 92656
Phone: (949) 389-6000
(800) 662-4471

EMEA Headquarters

Surrey Technology Centre
40 Occam Road
Guildford GU2 5YG
Surrey, UK
Phone: (44) 1483-295825
Fax: (44) 1483-295827

APAC Headquarters

Servants International Corporation

(QLogic exclusive representative)
1-15-9 Hosoe Bldg. 4F
Kojima-cho, Chofu-shi
Tokyo 182
JAPAN
Phone: 81 424889649
Fax: 81 424889648

Partner Programs

Channel Programs

877-975-6442
reseller@qlogic.com

Business Alliances Programs

949-389-6557
santrackpartners@qlogic.com

Sales Education and Technical Training

Technical Training

tech.training@qlogic.com

Sales Training

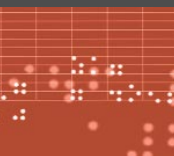
sales.training@qlogic.com

Sales Information

800-662-4471

Technical Support

952-932-4040
support@qlogic.com



QLOGIC



QLogic solutions include industry-leading controller chips, host bus adapters, network switches and management software. Last year, more than 7 million products that shipped from leading storage companies like Cisco, Dell, EMC, Fujitsu, Hitachi, HP, IBM, Quantum, Sony, StorageTek and Sun were "Powered by QLogic"

That's why QLogic is widely recognized as a leader in the market for storage area networking. Recent accolades include:

Member of NASDAQ 100 Index
Member of S&P 500 Index
Barron's 500
Bloomberg Top 10 High Tech Company
Business 2.0 100 Fastest Growing Tech Companies
BusinessWeek Global 1000

BusinessWeek Hot Growth Company
Forbes Best 200 Small Companies
Fortune's 100 Fastest Growing Companies
Network Computing
• Editor's Choice
• "Well Connected" Data Management and Storage Technology Product of the Year

WWW.QLOGIC.COM

QLogic Corporation | 26650 Aliso Viejo Parkway | Aliso Viejo, CA 92656 | 949.389.6000

